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INDEX

Volume VII

1917

January	pp.	1–116	July	pp.	591–654
February	pp.	117–224	August	pp.	655–724
March	pp.	225–358	September	pp.	725–802
April	pp.	359–444	October	pp.	803–906
May	pp.	445–526	November	pp.	907–980
June	pp.	527–590	December	pp.	981–1062

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SOCIAL WORK
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1917

INDEX

PAGE

Activated Sludge Experiments at the University of Illinois. Edward Bartow, F. W. Mohlman and J. F. Schnellbach 679
Acupuncture: The Best Method of Vaccination. H. W. Hill 301
Acute Contagious Disease in the French Army. Edouard Rist 981
Acute Lobar Pneumonia, Suggestions Concerning the Prevention and Cure of. Rufus Cole, M. D. 548
Address of President, American Public Health Association, October 19, 1917. W. A. Evans 907
Advertisements, Venereal. Editorial 826
Advertisers and Their Advertisements, Our. Editorial 743
Air Analysis, Bacterial, Improved Technic in. William W. Browne 52
Air, Final Report of the Committee on Standard Methods for the Examination of 54
Albaugh, R. P.:
  The Dangers Connected with the Spray Method of Finishing and Decorating 279
  Gasoline Engine Exhaust-Gas Poisoning 664
Albert, Henry, Jack Hinman and Gharrett Jordan. Bacterial Changes in Uniced Water, etc. A New Container 1010
Alcohol—A Public Health Problem. Haven Emerson 555
Alcohol Poisoning by Inhalation, Visceral Changes in Wood. Arthur Alexander Eisenberg 765
American Public Health Association, Cincinnati, O., October 24–27, 1916, Minutes of the Forty-fourth Annual Meeting of the 73
American Public Health Association. Minutes of the Forty-fifth Annual Meeting 1045
American Public Health Association, The Institute of Health. Editorial 478
Ammonia from the Action of Caustic Soda on Organic Matter a Source of Error in the Determination of Nitrates. Stephen DeM. Gage and Henry H. Anderson 689
Analytical Methods to the Sanitary Engineering Section, Report of Committee on Sewage Works Operation and 680
Anderson, Henry H. and DeM. Gage. Ammonia from the Action of Caustic Soda on Organic Matter a Source of Error in the Determination of Nitrates 689
Annual Meeting, Washington, D. C., Program of the Forty-Fifth 882
Annual Meeting, Change of. Editorial 673
Application of the Score Card System to the Sanitary Quality of Public Water Supplies in the State of New York. Theodore Horton and E. Sherman Chase 380
Application of the Statistical Method to the Field of Public Health Service. Louis I. Dublin 14
Armstrong, Donald B.:
  Necessity for Health Standards 1
  Framingham Health and Tuberculosis Demonstration 318
Army, Health Problems of the. W. C. Gorgas 937
Army Sanitary Service Created 666
Association at Washington, The Recent Meeting of the. Editorial 934
Atmospheric Conditions upon Fatigue and Efficiency, Effect of. C.-E. A. Winslow 827
Authors, A Notice to. Editorial 673
Bacillus Coli in Milk—A Preliminary Report. Frederick A. Baldwin 391
Bacillus Coli, Method of Isolating and Identifying. Stephen J. Hauser 1050
Bacterial Changes in Uniced Specimens of Water, etc. Henry Albert, Jack Hinman, and Gharrett Jordan 1010
Bacterial Content of Milk, Some Observations on the. Francis H. Slack 690
Bacterial Methods for Miscellaneous Food Products, Report of the Committee on Standard 962

OCT 28 1918
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PAGE

Bacteria, Some Differential Reactions of Coli-like 784
Baldwin, Frederick A. Bacillus Coli in Milk 391
Barnard, Harry E. New Ideas in Food Control 960
Barracks and Camps, Sanitation in Some Canadian. Major J. G. Fitzgerald and Major J. W. S. McCullough 655
Bartow, Edward, F. W. Mohlman, J. F. Schnellbach. Activated Sludge Experiments at the University of Illinois 679
Bell, F. D., Chairman. Fifth Report of the Committee on Cold Storage 306
Biggs, Hermann M., A Great Sanitarian. Editorial 41
Biggs, Hermann M. Tuberculosis in France 606
Births, Check for the Registration of. William H. Davis 762
Birth Control in Its Medical, Social, Economic, and Moral Aspects. S. A. Knopf 152
Births and Deaths in Metropolitan Areas—History, Methods, Results and Checks, Enforcement of Registration of. Wm. H. Guilfoy 619
Births, Registration Area for. Editorial 150
Boards of Health to General Preparedness—Relation of State and Local. A. J. McLaughlin, W. P. Chamberlain, Harold C. Ernst, Francis X. Mahoney, Wm. G. Kirschbaum, Dr. Dionne, Laura Hughes, David Brough 591
Bolduan, Charles F. What We Have Learned from the New York Epidemic of Anterior Poliomyelitis 86
Book Reviews 93, 197, 331, 420, 505, 573, 711, 789, 869, 966, 1045
Boyd, Mark F. De-Lousing Measures of the Santa Fe Railway System 667
Braisted, William C. The Navy and Its Health Problems 928
Bread Sold in Washington, D. C., Composition and Relative Economy of Some. M. A. Pozen and M. Starbecker 570
Breed, Robert S., G. L. A. Ruehle and George A. Smith. Milking Machine as a Factor in the Production of Sanitary Milk 840
Brough, David, Laura Hughes, A. J. McLaughlin, W. P. Chamberlain, Harold C. Ernst, Francis X. Mahoney, Wm. G. Kirschbaum, Dr. Dionne. Relation of State and Local Boards of Health to General Preparedness 591
Brown, William Eustis. Sewage Disposal Problems of a Coast Summer Resort 944
Brown, William W.:
  Improved Technic in Bacterial Air Analysis 52
  Fallacy of Reading Accurately Gas Percentages in the Fermentation of Sugar Media 663
Bunker, John W. M. Mosquito Growth in Catch Basins 956
Camp in Its Relation to a Civilian Community, Large Concentration. Charles E. Simpson 806
Camps, Sanitation in Some Canadian Barracks and. Major J. G. Fitzgerald and Major J. W. S. McCullough 655
Canadian Barracks and Camps, Sanitation in Some. Major J. G. Fitzgerald and Major J. W. S. McCullough 655
Catch Basins, Mosquito Growth in. John W. M. Bunker 956
Caverly, Charles S. Henry Dwight Holton—An Appreciation and Biographical Sk 303
Chamberlain, W. P., Harold C. Ernst, Francis X. Mahoney, Wm. G. Kirschbaum, Dr. Dionne, Laura Hughes, David Brough, A. J. McLaughlin. Relation of State and Local Boards of Health to General Preparedness 591
Change of Annual Meeting. Editorial 673
Chase, E. Sherman, and Theodore Horton. The Application of the Score Card System to the Sanitary Quality of Public Water Supplies 380
Check for the Registration of Births. William H. Davis 762
Checks, Enforcement of Registration of Births and Deaths in Metropolitan Areas—History, Methods, Results and. Wm. H. Guilfoy 619
Chesley, A. J. Uses of Morbidity Reports by the Minnesota State Department of Health 744
Cold Storage, Fifth Report of the Committee on. F. D. Bell, Chairman 306
Cole, Rufus. Suggestions Concerning the Prevention and Cure of Acute Lobar Pneumonia 548

PAGE

Coli-like Bacteria, Some Differential Reactions of 784

Committee on Sewage Works Operation and Analytical Methods to the Sanitary Engineering Section, Report of 680

Committee on Sewerage and Sewage Disposal, Report of 847

Committee on Standard Methods for the examination of Air, Final Report of the 54

Committee on Standard Bacterial Methods for Miscellaneous Food Products, Report of the 962

Committee on the Standardization of the Work of Public Health Officials, Preliminary Report of 771

Committee on Street Cleaning, Report of 854

Common or Public Nuisance—The Tubercular Milch Cow. J. F. Winchester 83

Communications 439, 521, 585, 651, 722, 799

Comparability—The Will-o'-the-Wisp of Cause of Death Statistics. George H. Van Buren 1016

Composition and Relative Economy of Some Bread Sold in Washington, D. C. M. A. Pozen and M. Starbecker 570

Conn, Herbert W. Editorial 480

Costello, Charles A. Principal Defects Found in Persons Examined for Service in the United States Navy 489

Council of National Defense. Franklin Martin 733

County Health Work, The Evolution of. W. S. Rankin 998

Crum, Frederick S. A Statistical Study of Diphtheria 445

Current Public Health Literature 114, 221, 354, 441, 523, 588, 653, 723, 800, 880

Dairy Score Cards, A Survey of. Charles E. North 25

Dangers Connected with the Spray Method of Finishing and Decorating. R. P. Albaugh 279

Davis, William H. Check for the Registration of Births 762

Death-Rate of Washington. W. F. Wilcox 562

Death-Rates in Old and Young States. T. D. Tuttle 359

Deaths in Metropolitan Areas—History, Methods, Results and Checks, Enforcement of Registration of Births and. Wm. H. Guilfoy 619

De-Lousing Measures of the Santa Fe Railway System. Mark F. Boyd 667

Designs for Privies. Richard Messer 190

Determination of Ice Cream as a Factor in the Spread of Typhoid Fever Infection. L. L. Lumsden 1005

Diagnosis of Syphilis from Specimens Sent to the Laboratory. Adolph Gehrmann 964

Diagnostic Laboratories in Public Health Work. Stovall, W. D. 759

Dionne, Dr., Laura Hughes, David Brough, A. J. McLaughlin, W. P. Chamberlain, Harold C. Ernst, Francis X. Mahoney, Wm. G. Kirschbaum. Relation of State and Local Boards of Health to General Preparedness 591

Diphtheria, A Statistical Study of. Frederick S. Crum 445

Disease, Housing Conditions as Factors in the Production of. James Ford 42

Disease in the French Army, Acute Contagious. Edouard Rist 981

Diseases, Missing Links in the Chain of Evidence Concerning Occupational 835

Dishwashing, Observations and Experiments on. Wallace A. Manheimer 614

Disinfectants and Its Bearing on Their Standardization, Specificity of. A. L. Walters 1030

Disinfection, Facts and Fallacies in. Herbert C. Hamilton 282

Dispensary Problems of Gonorrhea and Syphilis. Alec N. Thomson 493

Disposal Plants, Recent Developments in the Design of Municipal Waste. G. R. Tuska 754

District Plan, Health Administration on the. Alfred E. Shipley 248

Dublin, Louis I. The Application of the Statistical Method to the Field of Public Service 14

Dusty Trades, Menace of the. W. Gilman Thompson 737

PAGE
Economy of Some Bread Sold in Washington, D. C., Composition and Relative. M. A. Pozen and M. Starbecker.... 570
Eddy, Harrison P., Chairman. Report of the Committee on the Sanitary Control of Waterways.... 407
Editorials, 40–41, 150–151, 260, 378, 478–480, 560, 612–613, 672–674, 742–743, 824–826, 934–936
Educational Work of the Brooklyn Anti-Tuberculosis Committee. Hester D. Jenkins... 187
Effect of Atmospheric Conditions upon Fatigue and Efficiency. C.-E. A. Winslow.... 827
Efficiency, Effect of Atmospheric Conditions upon Fatigue and. C.-E. A. Winslow.... 827
Eisenberg, Arthur Alexander. Visceral Changes in Wood Alcohol Poisoning by Inhalation.... 765
Emerson, Haven, M. D. Alcohol—A Public Health Problem.... 555
Enforcement of Registration of Births and Deaths in Metropolitan Areas—History, Methods, Results and Checks. Wm. H. Guilfoy.... 619
Epidemic of Anterior Poliomyelitis, What We Have Learned from the New York. Charles F. Bolduan.... 86
Epidemic Poliomyelitis, Results of Studies on. E. C. Rosenow.... 994
Epidemiology of Poliomyelitis, Graphical Study of the. T. G. Hull.... 813
Epidemiological Studies, Use of Vital Statistics in. Allen W. Freeman.... 624
Ernst, Harold C., Francis X. Mahoney, Wm. G. Kirschbaum, Dr. Dionne, Laura Hughes, David Brough, A. J. McLaughlin, W. P. Chamberlain. Relation of State and Local Boards of Health to General Preparedness.... 591
Evans, W. A. Address of President, American Public Health Association, October 19, 1917.... 907
Evolution of County Health Work, The. W. S. Rankin.... 998
Examination of Recruits for the Army and Militia. Harry D. Orr.... 485
Eye Conditions Shown in Medical Inspection of Schools. Wm. H. Peters.... 782
Facts and Fallacies in Disinfection. Herbert C. Hamilton.... 282
Fakers and Charlatans, Illegal Practitioner. German A. Jordan.... 725
Fallacies in the Investigation of Water Supplies. H. A. Whittaker.... 785
Fallacy of Reading Accurately Gas Percentages in the Fermentation of Sugar Media. William W. Browne.... 663
Fatigue and Efficiency, Effect of Atmospheric Conditions upon. C.-E. A. Winslow.... 827
Feiss, Richard A. Scientific Management and Its Relation to the Health of the Worker 262
Fitzgerald, Major J. G. and Major J. W. S. McCullough. Sanitation in Some Canadian Barracks and Camps.... 655
Food Conservation and the War. Herbert C. Hoover.... 922
Food Control, New Ideas in. Harry E. Barnard.... 960
Food Products, Report of the Committee on Standard Bacterial Methods for Miscellaneous.... 962
Ford, James. Housing Conditions as Factors in the Production of Disease.... 42
Framingham Health and Tuberculosis Demonstration. Donald B. Armstrong.... 318
France, Professor Gunn Departs for. Editorial.... 672
France, The Tuberculosis Commission for. Editorial.... 613
France, Tuberculosis in. Hermann M. Biggs.... 606
Freeman, Allen W. Use of Vital Statistics in Epidemiological Studies.... 624
Fronczak, Francis E. Modern Chemical Industries and Public Health.... 268
French Army, Acute Contagious Disease in the. Edouard Rist.... 981
Gage, DeM. and Henry H. Anderson. Ammonia from the Action of Caustic Soda on Organic Matter a Source of Error in the Determination of Nitrates.... 689
Gamble, J. A. Milk Supervision and Its Control.... 953
Gasoline Engine Exhaust-Gas Poisoning. R. P. Albaugh.... 664
Gehrmann, Adolph. The Diagnosis of Syphilis from Specimens Sent to the Laboratory 964
Gonorrhea and Syphilis, Dispensary Problems of. Alec N. Thomson.... 493

PAGE
Goodwin, T. H. Preservation of the Health of the Soldier on the Western Front....... 940
Gorgas, W. C. Health Problems of the Army.................................... 937
Graphic Illustration of Sanitary Conditions in a Community, Necessity of. M. R. Mobley.. 787
Graphical Study of the Epidemiology of Poliomyelitis. T. G. Hull.................. 813
Greeley, S. A., Chairman. Report of the Committee on Refuse Collection and Disposal.. 412
Guilfoy, Wm. H. Enforcement of Registration of Births and Deaths in Metropolitan Areas—History, Methods, Results and Checks............................. 619
Hamilton, Herbert C. Facts and Fallacies in Disinfection......................... 282
Harrington, Thos. F. Industrial Health.. 322
Hauser, Stephen J. Method of Isolating and Identifying Bacillus Coli.............. 1050
Hay-Fever Prevention in the United States, A Year's Work in. William Scheppegrell 173
Health Administration on the District Plan. Alfred E. Shipley..................... 248
Health Department Reports and Notes..............94, 198, 332, 422, 507, 574, 714, 791, 870
Health, Industrial. Thomas F. Harrington... 322
Health Information Bureau. Editorial... 151
Health Law, Maine's New. C. E. Turner.. 502
Health Officer, Monthly Schedule for. Harold B. Wood.............................. 637
Health Officers, Proper Pay for. Editorial.. 936
Health Officers' Reserve Bill in Danger. Editorial................................ 826
Health of the Worker, Scientific Management and Its Relation to the. Richard A. Feiss 262
Health on the Highways, Preaching. Ennion G. Williams.............................. 179
Health Problems of the Army. W. C. Gorgas... 937
Health Protection after the War. Editorial.. 825
Health Standards, Necessity for. Donald B. Armstrong.............................. 1
Health Work, The Evolution of County. W. S. Rankin................................ 998
Hicks, John R. Modern Hygiene of Typhus Fever—Its Application at the Port of New York.. 628
Hill, H. W. Acupuncture: The Best Method of Vaccination............................ 301
History, Methods, Results and Checks, Enforcement of Registration of Births and Deaths in Metropolitan Areas. Wm. H. Guilfoy.................................. 619
Holton, Henry Dwight—In Memoriam. Editorial.. 260
Holton, Henry Dwight, An Appreciation and Biographical Sketch. Charles S. Caverly 303
Hoover, Herbert C. Food Conservation and the War 922
Horowitz, Murray P. Synoptic Report on a Sanitary Survey of Two Massachusetts Cities 698
Horton, Theodore, and E. Sherman Chase. The Application of the Score Card System to the Sanitary Quality of Public Water Supplies.............................. 380
Hospital and Industrial Hygiene, The. Wade Wright................................... 949
Housing Conditions as Factors in the Production of Disease. James Ford............ 42
Housekeeping and the Public Health. Marion Talbot.................................. 1026
Hughes, Laura, David Brough, A. J. McLaughlin, W. P. Chamberlain, Harold C. Ernst, Francis X. Mahoney, Wm. G. Kirschbaum, Dr. Dionne. Relation of State and Local Boards of Health to General Preparedness.............................. 591
Hull, T. G. Graphical Study of the Epidemiology of Poliomyelitis.................... 813
Hygiene and the War, Personal. Editorial... 742
Ice Cream as a Factor in the Spread of Typhoid Fever Infection, The Determination of. L. L. Lumsden 1005
Illegal Practitioner, Fakers and Charlatans. German A. Jordan...................... 725
Improved Technic in Bacterial Air Analysis. William W. Browne...................... 52
Industrial Health. Thomas F. Harrington.. 322
Industrial Hygiene, The Hospital and. Wade Wright................................... 949

PAGE
Industrial Hygiene, Relation of the Public Health Service to Problems of. J. W. Kerr... 776
Industrial Hygiene and Sanitation..........107, 213, 348, 434, 518, 581, 649, 721, 797, 878, 975
Infantile Paralysis. Round Table Discussion.......... 117
Institute of Health of the American Public Health Association. Editorial.......... 478
Institutional Sewage Plants. Charles F. Mebus.......... 296
Integrity of Public Health Work. Editorial.......... 40
Jenkins, Hester D. Educational Work of the Brooklyn Anti-Tuberculosis Committee 187
Johnson, Fred R. Red Cross and Relief in Civilian Communities.......... 803
Jordan, German A. Illegal Practitioner, Fakers and Charlatans.......... 725
Kerr, J. W. Relation of the Public Health Service to Problems of Industrial Hygiene 776
Kirschbaum, Wm. G., Dr. Dionne, Laura Hughes, David Brough, A. J. McLaughlin, W. P. Chamberlain, Harold C. Ernst, Francis X. Mahoney. Relation of State and Local Boards of Health to General Preparedness.......... 591
Kligler, I. J. Simple Medium for the Rapid Differentiation of Typhoid and Paratyphoid Bacilli..........805, 1042
Knopf, S. A. Birth Control in Its Medical, Social, Economic, and Moral Aspects...... 152
Laboratories in Cleveland, Method of Distributing and Collecting Diagnosis Outfits for the Bureau of. R. G. Perkins.......... 416
Laboratories in Public Health Work, Diagnostic. W. D. Stovall.......... 759
Laboratory Diagnosis of Poliomyelitis. Josephine B. Neal.......... 144
Laboratory, The Diagnosis of Syphilis from Specimens Sent to the. Adolph Gehrmann 964
Large Concentration Camp in Its Relation to a Civilian Community. Charles E. Simpson 806
Lumsden, L. L. The Determination of Ice Cream as a Factor in the Spread of Typhoid Fever Infection.......... 1005
McLaughlin, A. J., W. P. Chamberlain, Harold C. Ernst, Francis X. Mahoney, Wm. G. Kirschbaum, Dr. Dionne, Laura Hughes, David Brough. Relation of State and Local Boards of Health to General Preparedness.......... 591
McCullough, Major J. W. S. and Major J. G. Fitzgerald. Sanitation in Some Canadian Barracks and Camps.......... 655
Mahoney, Francis X., Wm. G. Kirschbaum, Dr. Dionne, Laura Hughes, David Brough, A. J. McLaughlin, W. P. Chamberlain, Harold C. Ernst. Relation of State and Local Boards of Health to General Preparedness.......... 591
Maine's New Health Law. C. E. Turner.......... 502
Manheimer, Wallace A. Observations and Experiments on Dishwashing.......... 614
Martin, Franklin. Council of National Defense.......... 733
Massachusetts Association of Boards of Health..........82, 316, 591, 812
Mebus, Charles F. Institutional Sewage Plants.......... 296
Medical Inspection of Schools, Eye Condition Shown in. Wm. H. Peters.......... 782
Medicine Situation, Patent. John P. Street.......... 1037
Meeting, Washington, D. C., Program of the Forty-Fifth Annual.......... 882
Menace of the Dusty Trades. W. Gilman Thompson.......... 737
Messer, Richard. Designs for Privies.......... 190
Method of Distributing and Collecting Diagnosis Outfits for the Bureau of Laboratories in Cleveland. R. G. Perkins.......... 416
Michigan's Part in the War on Tuberculosis. Arnold Mulder.......... 182
Military Sanitation in the Present War. Thorndike Saville.......... 527
Milk, Bacillus Coli in. Frederick A. Baldwin.......... 391
Milking Machine as a Factor in the Production of Sanitary Milk. G. L. A. Ruehle, Robert S. Breed, and George A. Smith.......... 840
Milk, Some Observations on the Bacterial Content of. Francis H. Slack.......... 690
Milk Supervision and Its Control. J. A. Gamble.......... 953
Mineral Water Industry, Present Status of the. Frank L. Rector.......... 868
Minutes of the Forty-fourth Annual Meeting of the American Public Health Association, Cincinnati, Ohio, October 24–27, 1916.......... 73

PAGE
Minutes of the Forty-fifth Annual Meeting, Washington, D. C., October 17–20, 1917 1045
Missing Links in the Chain of Evidence Concerning Occupational Diseases. W. H. Rand 835
Mobley, M. R. Necessity of Graphic Illustration of Sanitary Conditions in a Community 787
Model Law for Reporting Stillbirths. Lee W. Thomas 46
Modern Chemical Industries and Public Health. Francis E. Fronczak 268
Modern Hygiene of Typhus Fever—Its Application at the Port of New York. John R. Hicks 628
Mohlman, F. W., Edward Bartow, J. F. Schnellbach. Activated Sludge Experiments at the University of Illinois 679
Monthly Schedule for Health Officer. Harold B. Wood 637
Morbidity Reports by the Minnesota State Department of Health, Uses of. A. J. Chesley 744
Mosquito Growth in Catch Basins. John W. M. Bunker 956
Mouth Hygiene, Present Status of and Necessity for. Sidney J. Rauh 631
Mulder, Arnold. Michigan's Part in the War on Tuberculosis 182
Munition-Plant Poisons. Archie Rice 273
Navy and Its Health Problems, The. William C. Braisted 928
Neal, Josephine B. Laboratory Diagnosis of Poliomyelitis 144
Necessity for Health Standards. Donald B. Armstrong 1
Necessity of Graphic Illustration of Sanitary Conditions in a Community. M. R. Mobley 787
New Ally for Public Health. Editorial 674
New Ideas in Food Control. Harry E. Barnard 960
Nitrates, Ammonia from the Action of Caustic Soda on Organic Matter a Source of Error in the Determination of. DeM. Gage and Henry H. Anderson 689
North, Charles E. A Survey of Dairy Score Cards 25
Note Sections, Two New. Editorial 1004
A Notice to Authors. Editorial 673
Observations and Experiments on Dishwashing. Wallace A. Manheimer 614
Occupational Diseases, Missing Links in the Chain of Evidence Concerning. W. H. Rand 835
Officers for the Coming Year. Editorial 935
Orr, Harry D. Examination of Recruits for the Army and Militia 485
Our Advertisers and Their Advertisements. Editorial 743
Paralysis, Infantile. Round Table Discussion 117
Paratyphoid Bacilli, Simple Medium for the Rapid Differentiation of Typhoid and. I. J. Kligler 805, 1042
Pay for Health Officers, Proper. Editorial 936
Period after "Per Cent," The. Editorial 1004
Perkins, R. G. Method of Distributing and Collecting Diagnosis Outfits for the Bureau of Laboratories in Cleveland 416
Personal Hygiene and the War. Editorial 742
Personal Notes 113, 218, 353, 439, 522, 586, 652, 722, 799, 880, 978
Peters, Wm. H. Eye Conditions Shown in Medical Inspection of Schools 782
Phalen, James M. United States Army Methods of Disposal of Camp Refuse 481
Poisoning, Gasoline Engine Exhaust-Gas. R. P. Albaugh 664
Poisons, Munition-Plant. Archie Rice 273
Poliomyelitis, Anterior, What We Have Learned from the New York Epidemic of. Charles F. Bolduan 86
Poliomyelitis, Graphical Study of the Epidemiology of. T. G. Hull 813
Poliomyelitis, Laboratory Diagnosis of. Josephine B. Neal 144
Poliomyelitis, Results of Studies on Epidemic. E. C. Rosenow 994
Pozen, M. A. and M. Starbecker. Composition and Relative Economy of Some Bread Sold in Washington, D. C. 570

PAGE

Preaching Health on the Highways. Ennion G. Williams 179

Preliminary Report of Committee on the Standardization of the Work of Public Health Officials 771

Preparedness, Relation of State and Local Boards of Health to General. A. J. McLaughlin, W. P. Chamberlain, Harold C. Ernst, Francis X. Mahoney, Wm. G. Kirschbaum, Dr. Dionne, Laura Hughes, David Brough 591

Present Status of and Necessity for Mouth Hygiene. Sidney J. Rauh 631

Preservation of the Health of the Soldier on the Western Front. T. H. Goodwin 940

Present Status of the Mineral Water Industry. Frank L. Rector 868

President, American Public Health Association, October 19, 1917, Address of. W. A. Evans 907

Prevention and Cure of Venereal Diseases. Editorial 378

Principal Defects Found in Persons Examined for Service in the United States Navy. Charles A. Costello 489

Privies, Designs for. Richard Messer 190

Professor Gunn Departs for France. Editorial 672

Program of the Forty-Fifth Annual Meeting, Washington, D. C. 882

Program of Public Health for Cities. W. C. Rucker 225

Program of Public Health for Towns, Villages, and Rural Communities. Gustav F. Ruediger 235

Proper Pay for Health Officers. Editorial 936

Public Health Clippings 647, 719, 795, 876, 973

Public Health, A New Ally for. Editorial 674

Public Health for Cities, A Program of. W. C. Rucker 225

Public Health for Towns, Villages, and Rural Communities, A Program of. Gustav F. Ruediger 235

Public Health, Modern Chemical Industries and. Francis E. Fronczak 268

Public Health Notes 101, 206, 340, 429, 513, 578, 641, 716, 792, 871, 961

Public Health Officials, Preliminary Report of Committee on the Standardization of the Work of 778

Public Health Problem, Alcohol. Haven Emerson 555

Public Health Service, The Application of the Statistical Method to the Field of. Louis I. Dublin 14

Public Health Service to Problems of Industrial Hygiene, Relation of. J. W. Kerr 776

Public Health Work, Integrity of. Editorial 40

Rand, W. H. Missing Links in the Chain of Evidence Concerning Occupational Diseases 835

Rankin, W. S. The Evolution of County Health Work 998

Rauh, Sidney J. Present Status of and Necessity for Mouth Hygiene 631

Recent Developments in the Design of Municipal Waste Disposal Plants. G. R. Tuska 754

Recent Meeting of the Association at Washington. Editorial 934

Recruits for the Army and Militia, The Examination of. Harry D. Orr 485

Rector, Frank L. Present Status of the Mineral Water Industry 868

Red Cross and Relief in Civilian Communities. Fred R. Johnson 803

Red Cross Creates Sanitary Service Bureau 697

Red Cross Relief instead of Christmas Cards. Editorial 936

Refuse Collection and Disposal, Report of Committee on. S. A. Greeley, Chairman 412

Refuse Disposal in Small Towns. George W. Simons 299

Refuse, United States Army Methods of Disposal of Camp. James M. Phalen 481

Registration Area for Births. Editorial 150

Relation of the Public Health Service to Problems of Industrial Hygiene. J. W. Kerr 776

Relation of State and Local Boards of Health to General Preparedness. A. J. McLaughlin, W. P. Chamberlain, Harold C. Ernst, Francis X. Mahoney, Wm. G. Kirschbaum, Dr. Dionne, Laura Hughes, David Brough 591

PAGE

Report (Fifth) of the Committee on Cold Storage. F. D. Bell, Chairman 306

Report of the Committee on Refuse Collection and Disposal. S. A. Greeley, Chairman 412

Report of the Committee on Sanitary Control of Waterways. Harrison P. Eddy, Chairman 407

Report of Committee on Sewerage and Sewage Disposal 847

Report of Committee on Sewage Works Operation and Analytical Methods to the Sanitary Engineering Section 680

Report (Final) of the Committee on Standard Methods for the Examination of Air 54

Report of the Committee on Standard Bacterial Methods for Miscellaneous Food Products 962

Report of Committee on Street Cleaning 854

Report (Progress) of the Committee on Venereal Diseases. Wm. F. Snow, Chairman 414

Reserve Bill in Danger, Health Officers. Editorial 826

Resolutions Adopted by the Conference of State and Territorial Health Officials at the Sessions Held in Washington, April 30–May 3, 1917. Editorial 560

Results of Studies on Epidemic Poliomyelitis. E. C. Rosenow 994

Rice, Archie. Munition-Plant Poisons 273

Rist, Edouard. Acute Contagious Disease in the French Army 981

Rosenow, E. C. Results of Studies on Epidemic Poliomyelitis 994

Round Table Discussion. Infantile Paralysis 117

Rucker, W. C. Program of Public Health for Cities 225

Ruediger, Gustav F. Program of Public Health for Towns, Villages, and Rural Communities 235

Ruehle, G. L. A., Robert S. Breed and George A. Smith. Milking Machine as a Factor in the Production of Sanitary Milk 840

Sanitarian and the War. Editorial 479

Sanitary Conditions in a Community, Necessity of Graphic Illustration of. M. R. Mobley 787

Sanitary Service Bureau, Red Cross Creates 697

Sanitary Service Created, Army 666

Sanitary Service in the War. Editorial 673

Sanitation in Some Canadian Barracks and Camps. Major J. G. Fitzgerald and Major J. W. S. McCullough 655

Saville, Thorndike. Military Sanitation in the Present War 527

Saving Sight—Saving Citizens. Edward M. VanCleve 675

Scheppegrell, William. A Year's Work in Hay Fever Prevention in the United States 173

Schneider, Franz, Jr. Some Shortcomings of Socio-Sanitary Investigations 3

Schnellbach, J. F., Edward Bartow, F. W. Mohlman. Activated Sludge Experiments at the University of Illinois 679

Scientific Management and Its Relation to the Health of the Worker. Richard A. Feiss 262

Sewage Disposal Problems of a Coast Summer Resort. William Eustis Brown 944

Sewage Plants, Institutional. Charles E. Mebus 296

Sewage Works Operation and Analytical Methods to the Sanitary Engineering Section, Report of Committee on 680

Sewerage and Sewage Disposal, Report of Committee on 847

Shipley, Alfred E. Health Administration on the District Plan 248

Simons, George W. Refuse Disposal in Small Towns 299

Simple Medium for the Rapid Differentiation of Typhoid and Paratyphoid Bacilli. I. J. Kligler 805

Simpson, Charles E. Large Concentration Camp in Its Relation to a Civilian Community 806

Slack, Francis H. Some Observations on the Bacterial Content of Milk 690

Smith, George A., Robert S. Breed and G. L. A. Ruehle. Milking Machine as a Factor in the Production of Sanitary Milk 840

PAGE

Snow, Wm. F., Chairman. Report of the Committee on Venereal Diseases 414

Social Unit Plan Consults Doctors. Editorial 743

Socio-Sanitary Investigations, Some Shortcomings of. Franz Schneider, Jr. 3

Soldier on the Western Front, Preservation of the Health of. T. H. Goodwin 940

Some Differential Reactions of Coli-like Bacteria 784

Some Observations on the Bacterial Content of Milk. Francis H. Slack 690

Some Shortcomings of Socio-Sanitary Investigations. Franz Schneider, Jr. 3

Specificity of Disinfectants and Its Bearing on Their Standardization. A. L. Walters 1030

Spray Method of Finishing and Decorating, The Dangers Connected with the. R. P. Albaugh 279

Stammering in Connection with Military Service. Ernest Tompkins 638

Standardization of the Work of Public Health Officials, Preliminary Report of Committee on the 771

Starbecker, M. and M. A. Pozen. Composition and Relative Economy of Some Bread Sold in Washington, D.C. 570

Statistical Method to the Field of Public Health Service, The Application of the. Louis I. Dublin 14

Statistical Study of Diphtheria. Frederick S. Crum 445

Statistics, Comparability—the Will-o'-the-Wisp of Cause of Death Statistics. George H. Van Buren 1010

Stillbirths, A Model Law for Reporting. Lee W. Thomas 46

Stovall, W. D. Diagnostic Laboratories in Public Health Work 759

Street Cleaning, Report of Committee on 854

Street, John P. The Patent Medicine Situation 1037

Sugar Media, Fallacy of Reading Accurately Gas Percentages in the Fermentation of. Wm. W. Browne 663

Suggestions Concerning the Prevention and Cure of Acute Lobar Pneumonia. Rufus Cole 548

Summer Resort, Sewage Disposal Problems of a Coast. William Eustis Brown 944

Survey of Dairy Score Cards. Charles E. North 25

Survey of Two Massachusetts Cities, Synoptic Report on a Sanitary. Murray P. Horowitz 698

Synoptic Report on a Sanitary Survey of Two Massachusetts Cities. Murray P. Horowitz 698

Syphilis and Gonorrhea, Dispensary Problems of. Alec N. Thomson 493

Syphilis from Specimens Sent to the Laboratory, The Diagnosis of. Adolph Gehrmann 964

Talbot, Marion. Housekeeping and the Public Health 1026

Thomas, Lee W. A Model Law for Reporting Stillbirths 46

Tompkins, Ernest. Stammering in Connection with Military Service 638

Thompson, W. Gilman. Menace of the Dusty Trades 737

Thomson, Alec N. Dispensary Problems of Gonorrhea and Syphilis 493

Trades, Menace of the Dusty. W. Gilman Thompson 737

Trask, J. W. The Work of the U. S. Public Health Service in Relation to the Present War 987

Tubercular Milch Cow, A Common or Public Nuisance. J. F. Winchester 83

Tuberculosis (Anti-) Committee, Educational Work of the Brooklyn. Hester D. Jenkins 187

The Tuberculosis Commission for France. Editorial 613

Tuberculosis Demonstration, The Framingham Health and. Donald B. Armstrong 318

Tuberculosis in France. Hermann M. Biggs 606

Tuberculosis, Michigan's Part in the War on. Arnold Mulder 182

Turner, C. E. Maine's New Health Law 502

Tuska, G. R. Recent Developments in the Design of Municipal Waste Disposal Plants 754

Tuttle, T. D. Death-Rates in Old and Young States 359

PAGE

Typhoid Fever Infection, The Determination of Ice Cream as a Factor in the Spread of. L. L. Lumsden ... 1005

Typhoid and Paratyphoid Bacilli, Simple Medium for the Rapid Differentiation of. I. J. Kligler ... 805, 1042

Typhus Fever—Its Application at the Port of New York, Modern Hygiene of. John R. Hicks ... 628

Unit Plan Consults Doctors, Social. Editorial ... 743

United States Army Methods of Disposal of Camp Refuse. James M. Phalen ... 481

United States Navy, Principal Defects Found in Persons Examined for Service. Charles A. Costello ... 489

U. S. Public Health Service in Relation to the Present War—The Work of the. J. W. Trask ... 987

Use of Vital Statistics in Epidemiological Studies. Allen W. Freeman ... 624

Uses of Morbidity Reports by the Minnesota State Department of Health. A. J. Chesley ... 744

Vaccination, The Best Method of: Acupuncture. H. W. Hill ... 301

Van Buren, George H. Comparability—the Will-o'-the-Wisp of Cause of Death Statistics 1010

Van Cleve, Edward M. Saving Sight—Saving Citizens ... 675

Venereal Advertisements. Editorial ... 826

Venereal Diseases, Prevention and Cure of. Editorial ... 378

Venereal Diseases, Report of the Committee on. Wm. F. Snow, Chairman ... 414

Venereal Problem, The War and the. Editorial ... 612

Visceral Changes in Wood Alcohol Poisoning by Inhalation. Arthur Alexander Eisenberg 765

Vital Statistics in Epidemiological Studies, Use of. Allen W. Freeman ... 624

Walters, A. L. The Specificity of Disinfectants and Its Bearing on Their Standardization ... 1030

War, Food Conservation and the. Herbert C. Hoover ... 922

War, Health Protection after the. Editorial ... 825

War and the Venereal Problem, The. Editorial ... 612

War, The Work of the U. S. Public Health Service in Relation to the Present War. J. W. Trask ... 987

War Meetings at Washington. Editorial ... 824

War, Military Sanitation in the Present. Thorndike Saville, C. E. ... 527

War, Personal Hygiene and the. Editorial ... 742

War, Sanitary Service in the. Editorial ... 673

War, The Sanitarian and the. Editorial ... 479

Washington, The Death-Rate of. W. F. Wilcox ... 562

Waste Disposal Plants, Recent Developments in the Design of Municipal. G. R. Tuska ... 754

Water Bacterial Changes in Uniced Specimens. A New Container, etc. Henry Albert, Jack Hinman, and Gharrett Jordan ... 1010

Water Industry, Present Status of the Mineral. Frank L. Rector ... 868

Water Supplies, Fallacies in the Investigation of. H. A. Whittaker ... 785

Water Supplies (Public) in the State of New York, The Application of the Score Card System to the Sanitary Quality of. Theodore Horton and E. Sherman Chase ... 380

Waterways, Report of the Committee on the Sanitary Control of. Harrison P. Eddy ... 407

Whittaker, H. A. Fallacies in the Investigation of Water Supplies ... 785

Wilcox, W. F. The Death-Rate of Washington ... 562

Williams, Ennion G. Preaching Health on the Highways ... 179

Winchester, J. F. A Common or Public Nuisance—The Tubercular Milch Cow ... 83

Winslow, C.-E. A. Effect of Atmospheric Conditions upon Fatigue and Efficiency ... 827

Wood, Harold B. Monthly Schedule for Health Officer ... 637

Work of the U. S. Public Health Service in Relation to the Present War, The. J. W. Trask ... 987

Wright, Wade. The Hospital and Industrial Hygiene ... 949

Year's Work in Hay Fever Prevention in the United States. William Scheppegrell ... 173

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THE NECESSITY FOR HEALTH STANDARDS.

DONALD B. ARMSTRONG, M. D.,
Executive Officer of the Community Health and Tuberculosis Demonstration, and Assistant Secretary of the National Association for the Study and Prevention of Tuberculosis.

Read before the Sections on Sociology and Vital Statistics in Joint Session, American Public Health Association, Cincinnati, Ohio, October 24–27, 1916.

AT THE Rochester conference of the American Public Health Association, during the closing meeting of the general sessions, a strong appeal was made by Dr. E. C. Levy of Richmond for a satisfactory formula to be used by health officers in the standardization of death-rates. Doctor Levy pointed out that while this would be an instrument to be employed by health officers, it was up to the statistician rather than to the health officer himself to provide the mechanism.

Undoubtedly the average health officer, because of the deficiency which Doctor Levy emphasized, is in a more or less serious plight today. It also happens that the socio-health investigator finds himself in much the same plight, and for a somewhat similar reason. In the average instance this type of health worker is not a statistician and does not have professional statistical training. Consequently, though his intentions may be of the best, he occasionally blunders into errors in his efforts to collect and present research data largely because he doesn't always know to what extent his subject is adaptable for a statistical analysis or because he is not familiar with the methods and limitations of accurate mathematical presentation.

It is true, of course, that socio-sanitary studies are carried out to increase knowledge and not to make statistics. The statistician, of course, must be the servant of the investigator. At the same time, much research work along these lines in invalidated, because of inaccuracies, hazardous generalities, the acceptance of assertion for proof, etc., on the one hand, or, on the other hand, because of lack of care in defining the scope of the inquiry, in classifying and tabulating data, in analyzing and interpreting results, etc. Is it not possible for the statistician to emphasize at least the basic requirements in the health investigative field? It is not to be supposed that socio-health research can ever be made absolutely foolproof. Can it not, however, with the assistance of the statistician and the standardization expert, be made a field less productive of unreliable and irresponsible findings, and less hazardous for the reputation of the investigator?

It would seem, to quote a recent communication from an American statistician of note, that "the usual socio-health investigator is willing to adopt in his search for facts, the method of the shot-gun rather than the rifle." He hopes that out of a poorly planned, but enthusiastically manned investigation, something useful will come. Sometimes something useful does result, but very frequently, too, there is promulgated an excessive amount of misinformation under the guise of pseudo-statistical accuracy. This is one reason, perhaps, why reformers so radically disagree, and may also have something to do with the fact that health administrators seldom get entrusted with adequate funds for their work. If the public judges us by our differences, and our inaccuracies, might it not be that we are receiving, for certain phases of public health work at least, about all the financial support our programme deserves?

Now, it seemed to the officers of the Sociological Section that this matter was of importance not to that section alone, but to the Association as a whole, as well. It seemed, further, that the most effective assistance might be expected from the Statistical Section. While the solution of these problems is vital to the balance and sense of the socio-health workers and to the validity and accuracy of their conclusions, it is, at the same time, essential to the good reputation of statistics, if not of the statisticians. Consequently an informal committee representing the two sections was created to prepare the present joint programme.

As many of you know, the first step after the preliminary consideration by this committee, was to send out a questionnaire soliciting information and suggestions along the lines indicated by the foregoing discussion. As a result of this work, it seemed that there were several approaches to the subject as a whole. It seemed, further, that it would be best to attempt to treat it, even though in a preliminary and somewhat superficial way, through at least two quite obvious channels. Consequently, the subsequent papers on the programme will attempt, first, to point out, from a general point of view, the chief defects of value judgment in modern socio-health investigations, and second, to discuss the commoner statistical errors in health work, together with methods for the application of corrective statistical devices. It is expected that the subsequent discussion, initiated by those whose names appear on the programme, will be, perhaps, the most illuminating part of the programme.

SOME SHORTCOMINGS OF SOCIO-SANITARY INVESTIGATIONS.

FRANZ SCHNEIDER, JR.,
Sanitarian, Department of Surveys and Exhibits, Russell Sage Foundation.

Read before the Sections on Vital Statistics and Sociology, American Public Health Association, Cincinnati, Ohio' October 26, 1916.

IN EXAMINING reports of investigations in the field where sociology and sanitation overlap, one is appalled by the frequency of slovenly technique, unsupported argument, and logical fallacy. Many of these reports, presumably presenting the results of scientific investigations, are hardly more than expressions of the authors' personal opinions. The figures presented are often of very questionable significance. The supporting evidence gleaned from other sources frequently takes the form of expressions of opinion. Yet these things are put forward as incontrovertible evidence, and, for the most part, with excellent and honest intentions. Examination of such reports produces a feeling of discouragement—almost of despair. There is so much poor work aggressively asserted, and so little good work. It is all very human, but it is all very far removed from science.

The cause of this state of affairs is not far to seek. Public health is not as yet an exact science; sociology is hardly a science at all. If we add that very few of the persons carrying on socio-sanitary investigations have had statistical training or experience, or, in fact, scientific training or experience. I think the situation is easily understood.

One's feelings on examining many of the reports in this field are well expressed by Professor A. G. Keller in his searching essay, "Sociology and Science."* Professor Keller inquires, with regard to the run of sociological treatises, " 'What would a genuine scientist, say, Professor———, think of this?' " His answer is, "An opulence of pronouncements; a dearth of evidence—with the result that the former are unverifiable, unless, perchance, they represent 'painful elaborations of the obvious.' "

I would like to draw attention to a few examples of this sort of thing in our own field, and try to point out the more important types of defect. In taking my first example from the field of housing betterment I wish particularly to emphasize the fact that I am heartily in sympathy with housing reform. Good housing is a matter of essential decency that can stand unshakable on the foundation of its own inherent desirability. What I wish to discuss is the scientific question of the effect of housing on health.

HOUSING AND HEALTH.

The investigation which I have examined is one of the more recent and more carefully made studies of housing conditions. I am prepared to believe that the part setting forth the actual conditions found in the houses (which occupies the major part of the report), is beyond criticism; the discussion of the relation between housing and public health starts, however, with the following words:

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* *The Nation*, New York City, Vol. 102, No. 2653, page 475, May 4, 1916.

"It seems almost useless repetition to refer at this time to such a well-established fact as the intimate relation existing between housing and the public health. The only excuse one can offer for referring to the subject is that, in spite of the fact that it is so evident and has been so definitely proved time and again by numerous observers, this aspect of the public health question has not received the attention from the public officials that it deserves.

"Without attempting to show in detail in just what manner the various common defects in housing affect the health of the tenants, we will merely call attention to the importance attached to housing by several national bodies and health officers."

The author then cites the facts that at the 1911 meeting of the American Association for the Study and Prevention of Infant Mortality there was a housing section, and that this section considered housing important; and that the British national tuberculosis association included the subject for discussion in the program for its meeting of 1914. He then quotes the opinions of five persons to the effect that housing is of predominant importance in tuberculosis; gives a few death-rate figures for Edinburgh and Liverpool; and concludes with a quotation which relates that in a certain city pin maps showing cases of infectious diseases corresponded to those showing bad housing conditions. The final paragraph of the section reads:

"The value of the opinions of these physicians and health officers who have given the subject considerable study and the experiences of these cities must convince even the most prejudiced that, from the standpoint of public health, the housing of the population is a matter which deserves the most careful consideration."

No references to sources are given.

I wish to analyze this example for a few moments as it impresses me as a striking instance of most positive statements backed up by the slightest scientific evidence.

In the first place, I think every one will agree that the fact that two national associations have admitted a subject to their programs and that certain members of these associations think the subject of predominating importance, amounts to nothing in the way of scientific evidence. Of no more convincing value is the citation of the similarity of the pin maps; it disregards the elementary principle of rates. In those parts of a city where population is densest it is but natural to expect a clustering of pins on the pin map—whether the latter represents cases of diseases, bad housing, or any other social manifestation.

With regard to his Edinburgh figures our author admits his doubts in the following words:

"It has been contended that tuberculosis was more prevalent in certain districts, not on account of the bad housing, but because, where bad housing was most prevalent, there one also found poverty, with all its associated evils."

He states, however, that: "The results obtained in Liverpool show the fallacy of this contention.

"The city of Liverpool in several districts tore down large sections of defective houses (from the standpoint of health) and erected suitable sanitary dwellings *in which practically the same people were housed who had occupied the former dwellings.* The result was that the phthisis death-rate fell in these districts from 4 per 1,000 to 1.9 per 1,000. The death-rate from consumption was more than cut in half by the improvement in *housing alone.*"*

Liverpool is accordingly his clinching evidence. He avers that practically the same people were rehoused and that the death-rate from phthisis was more than cut in half by the improvement in housing alone. This is evidence that, so our author says, must convince the most prejudiced. It certainly is important, if true. Let us see how it stands the test.

No reference is given to the paper or papers setting forth the Liverpool experience, so that the author may have had before him sources of information unavailable to me. However, I have examined the reports for 1912 and 1913 of the Housing Committee which has had this rehousing work in charge,† as well as the reports of the Medical Officer of Health for the years covered by the rehousing work.

The references to the health effects of the rehousing which I have found are as follows. In the report of the housing committee for 1912 there is the following paragraph (page 12):

"The improvement in the condition of the people rehoused by the Committee is very striking. Reliable statistics were available at the time the insanitary areas were dealt with, to show that the death-rate on these areas ranged from forty to sixty per thousand per annum, mainly due to the insanitary condition of the property, although squalor, bad habits, and the extreme poverty of the tenants were powerful factors in contributing to cause this high rate of mortality. The incidence of phthisis amongst these people, under their old conditions, resulted in an average annual death-rate of approximately 4 per 1,000. Under the new conditions, the general death-rate has been halved, and the average annual death-rate from phthisis has fallen to 1.9 per 1,000. A very careful investigation has been made into the incidence of typhoid fever, and leaves very little room for doubt that the defective and insanitary closet arrangements in the courts was one fruitful factor in the dissemination of this malady. It is a singular coincidence that year after year as the number of courts have diminished, so, also, the cases of typhoid have diminished; no doubt other factors were operative also, but that this was one, there is no reason whatever to doubt."

A little further on (page 15) we come to the following:

"It is, however, still to be regretted that the Infantile Mortality is exceptionally high. Based on the present population, and excluding the unrestricted tenements, the Infantile Mortality for the years 1909, 1910 and 1911 indicates a death-rate of 245 per 1,000, as compared with 139 per 1,000 for the entire city. Apart from other considerations, this fact alone emphasizes the necessity for special training on the part of those who supervise the Dwellings."

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* The italics appear in the original.

† City of Liverpool, Artizans and Labourers Dwellings and Insanitary Property, Reports of the Housing Committee, for 1912 and 1913; Liverpool, 1913 and 1914.

This is all the committee reports, and it is very little. In the report for 1913 these statements are reiterated in slightly different form (page 5); in addition (page 98) a table appears giving the average death-rate from all causes and the average phthisis death-rate for 1904–1906 of six of the unhealthy areas dealt with. The average population of these areas was 536; their general death-rates varied from 26.2 per 1,000 to 54.9, and averaged 44.4; their phthisis death-rates ranged from 1.1 to 7.0 per 1,000, and averaged 3.9. The significance of this table is doubtful, unless it is as a basis for the statements regarding rates of mortality before rehousing. A chart is given which shows decline in the city's typhoid fever rate, which parallels not only the number of courts and alleys but percentage of cases treated at home.

To sum up the evidence from the Housing Committee reports, it appears that the corporation has been rehousing displaced people since 1896, the rate of demolition since 1902 being something like 500 houses per year. By 1912 the corporation had under its control 2,747 dwellings, of which 79.7 per cent. were reserved for persons who had been dispossessed. It is stated that the phthisis death-rate has fallen from 4 per 1,000 under the old conditions to 1.9 per 1,000 under the new; but no specification is made as to the period covered by this fall or the area and population to which it applies, and no supporting evidence is adduced. Evidently the reports of the committee are not an adequate original source.

Turning to the annual reports of the Medical Officer of Health little more definite information is to be found. The same general assertion regarding the fall in the phthisis rate appears,* this evidently being the source of the Housing Committee's statement. I have been unable to find any definite elaboration of this general statement. In looking back through the reports it is evident that the process of rehousing was a gradual one extending over a period of about fifteen years, a period during which the general and phthisis death-rates of the whole of Liverpool and of all England underwent marked decline. We are not dealing with a clear-cut experiment of which a definite record has been kept and published. The data regarding the fall in phthisis among the rehoused is most fragmentary.

One's belief in the sweeping statement regarding the effect of housing on health in Liverpool is already shaken. But how about the statement that "*practically the same people were housed who had occupied the former dwellings?*" Well, the report of the Medical Officer for 1913 (page 299) states that the population of these corporation tenements was 10,223, of which 1,799, or 18 per cent., were "unrestricted"; that is, other than dispossessed. For six specific rehousing schemes 73 per cent. were rehoused in corporation dwellings; of all persons dispossessed since 1896 only some 64 per cent. were rehoused.* Thus a very considerable proportion of those dispossessed were not rehoused.

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* Report of the Medical Officer of Health for 1911, 239.

In addition, those rehoused were a carefully chosen group. Listen to the Medical Officer's report for 1907 (page 231); "The committee are already aware that in accordance with their instructions applicants of drunken habits and of dissipated character are excluded from the dwellings, and that a selection of the better class of dispossessed is being made. This is an additional reason why better results may be looked for." In other words, the poorer stock was weeded out. So much for practically the same persons being rehoused!

There remains the assertion that the death-rate from consumption was reduced "by the improvement in *housing alone*." The selection of the best tenants for rehousing of course vitiates the force of this statement, but there are other grounds for objection. For example, when rebuilding an area the corporation bought out and removed a large proportion of the saloons. The Medical Officer repeatedly emphasizes the importance of this policy and dwells on its beneficial results.† In addition we must reckon with an actively developing health department which inaugurated in 1897 a staff of Female Inspectors to do infant hygiene work in homes and which "little by little, was added to";* which initiated a system of milk depots in 1901;† which instituted a systematic medical inspection of school children in 1908;‡ and which in 1901 requested the reporting of tuberculosis and has since progressively developed a well-rounded campaign against the disease.§ Now when we find that there is reason to believe that the health department exercised especially close supervision over the corporation's own dwellings,|| that playgrounds and gymnasia were included in the rebuilding schemes,¶ and that old age pensions went into effect during the rehousing process, it becomes very evident that there was a great deal going on besides the improvement in housing alone.

The conclusion of the whole matter is something like this. The Liverpool rehousing work was not conceived as a demonstration of the effect of rehousing on health and was not carried on in such a manner as to permit a clean-cut answer to that question. The actual fall in disease rates is uncertain, because the time periods and populations involved are uncertain. Only two-thirds of the persons dispossessed were rehoused, and these were selected

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* Report of the Housing Committee, 1913, page 4.

† See Annual Reports: 1909, page xix; 1912, page 246; 1913, page 294.

* Annual Report of the Medical Officer of Health for 1913, page 64.

† *Ibid.* page 72.

‡ Annual Report of the Medical Officer of Health for 1908, page xv.

§ Annual Report of the Medical Officer of Health for 1913, page 101.

|| Annual Report of the Medical Officer of Health for 1911, page 252.

¶ Annual Report of the Medical Officer of Health for 1913, page 294.

with reference to their habits and desirability as tenants. Finally, many important health measures were undertaken simultaneously. The Liverpool experience is a splendid example of civic regeneration, but it has not contributed any convincing scientific evidence to our knowledge of housing and health.

I have gone into this reference to the Liverpool experience because it is a striking example of the hasty generalizations dogmatically uttered that are so frequent in reports dealing with social and health conditions, and because it occurred in one of the better reports. Before leaving the question of housing and health I would like to call attention to some of the other dangers that abound in this perilous field of investigation. These are well exposed in Prof. Karl Pearson's paper. "Eugenics and Public Health.* The ease and clearness with which Professor Pearson can lay bare the fallacies underlying apparently significant statistics will be a revelation to those unfamiliar with the publications of the Galton Eugenics Laboratory. In the paper mentioned he shows how the prevalence of phthisis among persons occupying different sized tenements may be associated with questions of age distribution, economic conditions, and the physique in the stock. In another place he takes up the oft quoted Glasgow data, published by the British Local Government Board, which represent that by virtue of living in four room tenements boys weighed 11.7 pounds more than boys living in one room tenements, and shows that of this difference 6.2 pounds was due simply to the fact that the boys living in one room houses were younger.*

And Pearson does more than subject the existing data regarding the social causes of tuberculosis to destructive criticism, he produces evidence regarding the importance of inherited physique that cannot be ignored. In considering the effect of environment we must take into consideration his investigations showing that whereas correlation between husband and wife with regard to tuberculosis is about that which they exhibit with regard to "sexually selected" physical, psychical, and pathological characteristics, the correlation between parents and children with regard to disease is twice as great, or an amount about equal to that exhibited between parents and children with regard to such inheritance factors as stature, eye color, deafmutism, and insanity.†

Altogether, it seems to me that we have very little scientific evidence regarding the effect of housing on health. The situation is aptly put by Dr. Charles J. Hastings in the following words:

"We naturally ask ourselves then,

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* Pearson, Karl: "Eugenics and Public Health, "Questions of the Day and of the Fray, No. VI; Cambridge University Press, London, 1912.

* Pearson, Karl: "Social Problems: Their Treatment, Past, Present, and Future," Questions of the Day and of the Fray, No. V; Dulau & Co., London, 1912.

† Pearson, Karl: "Tuberculosis, Heredity and Environment"; Dulau & Co., London, 1912.

For a discussion of the causes of the decline in the death-rate fron tuberculosis see the same author's, "The Fight Against Tuberculosis and the Death-Rate from Phthisis," Questions of the Day and of the Fray, No. IV, Cambridge University Press, London, 1911.

how much of the misery in our back streets is due to one thing and how much to another? How much is due to worry? How much to dark, dusty factories? How much to improper clothing? How much to improper, insufficient, or badly cooked food? How much to general malnutrition? How much to over-crowding? How much to unsanitary privy pits? How much to drunkenness and dissipation?

* * * * *

"Have we not taken too much for granted in the deductions we have made in the past in our investigations, and has not the time now come in the march of social progress when we must be more specific and debit to the various items of our list of social ills, the proportion of maladjustment due to each?

"While I do not wish for a moment to underestimate the significance of good housing conditions, yet I wish strongly to urge the necessity of a more careful analysis of the various causes of the greater prevalence of tuberculosis under bad housing conditions."*

OTHER EXAMPLES.

Let no one think that unsatisfactory investigation is limited to the field of housing and health. What are we to say of a report entitled "Facts About ———," which devotes three printed pages to an attempt "to obtain some information at first hand" regarding privies as a cause of an epidemic of diphtheria? Among other things the investigator reports the following choice bit of evidence:

"A very intelligent appearing woman, an old resident of North ———, says that undoubtedly condition of privies has something to do with spread of diphtheria, for as she counts the cases she finds most of them lived in houses with privies."

And further on:

"House found on Broadway, privy filled absolutely to the brim. One case of diphtheria on top floor."

Of course this is simply an example of a well-meaning person dabbling in something in ingenuous and almost total ignorance.

From another report, a "survey or social inventory" comes the following example of elegant vital statistics:

"There were in ———burg in 1913 ten deaths; of these five were male and five were female. They were distributed according to age as follows:

"1 under 1 year,
1 under 5 years,
3 between 50 and 60 years,
3 between 70 and 80 years,
2 between 80 and 90 years.

"Taking the population of ———burg at 683, the number given by the census of 1910, the death-rate would be 14.6 per 1,000 of the population. The death-rate of the United States is given as 16.3 per 1,000. H. N. Ogden, in his book, 'Rural Hygiene,' page 3, under the caption 'Ideal Death-rates,' says, in a comparison of the rates of different nations,—'Norway, Denmark and Sweden have rates of 14.5, 14.8 and 15.5, respectively; rates which may be considered as good as any country can attain at the present time.' Thus the health of ———burg would seem to be 'ideal.'"

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* Hastings, Charles J.: "Relative Prevalence of Tuberculosis Under Good and Bad Housing Conditions"; Transactions of Eleventh Annual Meeting of the National Association for the Study and Prevention of Tuberculosis, page 335, Baltimore, 1915 (105 East 22nd Street, New York City).

It is all very simple; if the crude death-rate of your city is under 15.5 its health conditions are ideal! It seems a pity that our statistician did not use the population estimate for 1913, which would have given ———burg 41 more inhabitants and would have reduced its death-rate from 14.6 to 13.8; but then, why try to improve on the "ideal?"

After all, these bulls by untrained investigators are not so remarkable when such a statement as the following can pass the eye of the editor of a recent text-book of educational hygiene. Speaking of the importance of sunshine in schools the contributor alludes to an experiment showing that tadpoles will not grow without sunlight, and continues:

"Just such an experiment society tried with babies in the dark rooms of New York's tenements, and every baby, almost without exception, born and kept in those rooms died. But when Jacob Riis and others tore down the windowless walls and the light of heaven streamed in, the babies began to live."[*]

Now I would like to have a reference to the source of that statement. Doesn't it come pretty close to being pure emotionalism?

Almost any number of instances of this sort of thing could be produced, but I shall not bother you with them further. Interested persons can refer to Pearson's papers, and there see shattered a number of widely-circulated and much referred-to investigations. The supposed blazing-up in the conception of idiots at the time of the vintage in wine-growing countries[*]; the figures reported as showing that unfitness for hard work is the result of alcoholism[†]; figures regarding the effect of employment of mothers, back-to-back houses, and other factors on infant mortality[‡]; and the question of "cancer houses" in Dublin[§]; all these are subjected to analysis with surprising results.

Association not Causation.

Is it possible to classify the shortcomings of socio-sanitary investigations and to say which are the most frequent and most important? Doctor Dublin will in his paper[¶] treat this question in a systematic way; I cannot refrain, however, from emphasizing one or two of the defects that seem of particular importance. The mistaking of association for causation is certainly one of the most serious. Two variables, such as a death-rate and an environmental condition, are measured; a variation in one is found to be associated with a corresponding variation in the other; from this the conclusion is jumped at all too frequently that the one is the cause of the other.

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[*] Educational Hygiene, Scribner, N. Y., 1915; page 389.

[*] Social Problems, etc., page 23.

[†] Eugenics and Public Health; page 22.

[‡] *Ibid.* page 24.

[§] *Ibid*, page 16.

[¶] Dublin, L. I.: "The Application of the Statistical Method to the Field of Public Health Research;" American Journal of Public Health, VII, 1, Jan., 1917, p. 14.

The logical fallacy involved is the same one we are familiar with in *post hoc* reasoning; after this, therefore, because of this. The avoidance of the error involves the application of the elementary principle: all other things being equal. The point seems too obvious to urge, yet it is overlooked with astounding ingenuousness.

The danger of mistaking association for causation is greatest when but a few of the possible factors are measured; as the number of associated factors is increased it becomes more obvious that the matter of causation is complicated. Thus in a recent investigation of infant mortality* the variation in mortality is given in association with some 32 possible causes, such as dryness of home, yard clean or dirty, number of others sleeping in the baby's room, age of mother, number of pregnancies, and earnings of the father. Now it is obvious that some of these associations are accidental and that others are not equally important, or not of importance equal to the variation in the mortality rate with which they are associated. For example, it would not be contended because the infant death-rate with water supply inside the house is 118 and 198 when outside, as compared with 132 with city water available and 148 without city water, that it is much more important to have the water supply inside the house than to have city water, although this is what the figures indicate. Or, as the figures indicate, that it is more important to have a bath-tub than a water-closet. But many an uninitiated investigator is capable of measuring association with a single variable, such as cleanliness of yard, and of announcing then that dirty yards are a main cause of infant mortality

The determination of true causation is a difficult matter, calling for much patient elimination of other factors, or the giving to them of due weight. Pearson puts the matter in this wise:

"Here we reach the great rule of modern statistics: 'When investigating the relation of two characters which you find associated, test whether they still remain related after you have given all other characters likely to be influential constant values. Before you have done this you certainly must not treat the relation as a *causative* one.'

"The full theory of this method is what in modern statistics we term the treatment by partial correlation."*

To many, such a painstaking mode of investigation before the acquirement of "results" may seem an intolerable hardship, but it is the price that must be paid if we are to acquire that degree of certainty in our conclusions, and the popular respect for the latter, which prevails in the case of the recognized sciences.

Definition of Terms.

Another of the major causes of unsatisfactory investigations is lack of precision in the use of language—lack of definition in the terms used. Anyone who has attempted to compare the results obtained in different investigations of the same general subject knows how fatal this defect is to the general usefulness of a piece of work. An indefinite term may mean one thing to the person who plans the investigation; another to one enumerator and something else to some other; and it may have an appreciably different meaning to the editor of the data. Results obtained under such conditions are frequently worse than useless. Part of the trouble consists in ignoring standardized terms when they exist; and this offense is the worse when the indefinite term is used so as to give the impression that a well-known term is meant. Even when definite terms are used in the investigation it sometimes happens that the published report fails to give the necessary specifications. An example of this is such a statement as "the contagious disease rate was 25," where no inkling is given as to the diseases included in the contagious rate, or as to whether the rate is figured per 10,000 or per 100,000 of population. Indefiniteness is certainly a most effective way of destroying the value of one's labors.

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* Duke, Emma: "Infant Mortality: Johnstown, Pa."; Children's Bureau, Washington, 1915.

* Eugenics and Public Health; page 24.

The Scientific Spirit.

Many other important points to be observed in making a statistical investigation are touched on in Doctor Dublin's paper.* Accordingly, I shall pass over the questions of an adequate plan, preparation of schedules and questionnaires, standardization of enumerators, collection, tabulation, and analysis of data, precision of measurements, and errors arising from paucity of data.

In closing I wish to enter a strong plea that we carry on our investigations in the scientific spirit rather than that of propagandism, or if on occasion we do carry on propaganda that we be frank about it, and not try to pass it off on an unsuspecting public as science. Otherwise we will be plunged back into the verbalism of the middle ages, and be ineffective as well, for, after all, I fancy that the public does suspect. Have not observant journalists taken the claims of various groups of social enthusiasts as to the percentage of a given social disease, such as poverty, caused by their particular evil and demonstrated that the sum is several hundred per cent. of importance?

In this connection interest attaches to the observations of Professor Keller on the failure of sociology to win the recognition accorded other sciences.* The reason is, he says:

"In part, certainly, because the phenomena are far more complex than those of natural science; certainly also because, in this field, we may not experiment. But it cannot be denied, either, that observation has been carried on in anything but a dispassionate and objective manner, that generalizations have been formed on entirely insufficient and often incorrectly observed data, and that such hasty generalizations have commonly been erected at once into dogmas, which have then served as a basis for endless and often grotesque deduction. Too many minds have conceived themselves to be of the unifying type, and have set themselves to harmonize a series of guesses, dreams, and utopias upon the basis of some 'principle' happily occurring to them.

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* *Loc. cit.*

* *Loc. cit.*

"The phenomena invite all this. Observation is made under bias, because the facts under review are those of human life, which touch human interests. A man can count the legs of a fly and report his findings without having his heart wrung because he thinks there are too many or too few. But when he observes the life of the society within which he himself lives, moves, and has his being, or some other human society near by, it is the rule that he shall approve or disapprove, be edified or horrified, by what he observes—that is, that he shall pass a moral judgment."

I think it is clear that investigations in the socio-sanitary field have suffered from these causes. The remedy is the application of the scientific spirit. We want less assertion and more evidence; less emotionalism and more reason; less faith and more science. Let us use standardized terms and methods when they exist, and let us be explicit as to terms and method when they do not. Let us have a well defined plan before commencing work, and let us beware of association masquerading as causation.

Let us above all preserve our work from the influence of our emotions—our bias. The opportunity for investigations in the socio-sanitary field to benefit the race is an extraordinary one. Let us not waste this opportunity by indulging ourselves in emotionalism. The latter is very human, and often very winning; but it has nothing to do with science, and will not get us very far in the right direction in the long run.

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SECRETARY HOUSTON'S REPORT.

Among the specific recommendations in the annual report of the Secretary of Agriculture are:

1. That the Secretary of Agriculture be authorized to establish legally enforceable standards of strength, quality, or purity for articles of food and for those articles of drugs which are sold under or by a name not recognized in the United States Pharmacopœia or National Formulary. The adoption of legally enforceable standards, the report states, will benefit the consumer and the honest manufacturer. Without them it is impossible to carry out completely the purposes of the Food and Drugs Act.

2. That the department be given authority to inspect establishments producing foods and drugs intended for shipment in interstate commerce. There are many forms of adulteration, the secretary says, which are difficult to detect without inspection of the place of manufacture. This is particularly true of foods produced under insanitary conditions.

3. The inauguration of a systematic campaign for the eradication of tuberculosis in cattle and swine. A recommendation has been included in the estimates for the fiscal year 1918 that an appropriation of $75,000 be made for the purpose.

4. That the name of the Office of Markets and Rural Organization be changed to Bureau of Markets. The secretary states that the importance of the work and the size of the organization fully justify this change, and that it is in the interest of simplicity and convenience. —*American Food Journal.*

THE APPLICATION OF THE STATISTICAL METHOD TO PUBLIC HEALTH RESEARCH.

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Read before Sections on Vital Statistics and Sociology, American Public Health Association, Cincinnati, Ohio, October 26, 1916.

THE statistical method is today an indispensable tool for conducting scientific investigations. It is especially important in the fields of public health and applied sociology, where the data are often not quantitative but qualitative in character and where conclusions drawn are more likely to be subject to error than in the field of the more exact sciences. The statistical method, however, is valuable only in so far as it permits certain deductions to be drawn with precision, thus replacing impression or opinion. It is worse than useless if it does not accomplish this end; for its use gives the appearance of accuracy and reliability to the conclusions which are justified only by the soundness of the method itself. Too many fallacies are mistaken for truth because they are stated in statistical terms or are deduced through apparently accurate statistical procedures. This, indeed, has been the cloak of many an error which has obstructed the progress of good public health work in America.

I propose in my part of the symposium to discuss the errors which are most important in themselves or are most frequently met with in the literature of the public health worker. In doing this I shall follow the sequence of the usual investigation. I shall consider, first, those errors which mar the investigation at the very outset, that is, those which arise in the planning of the inquiry, the preparation of the schedule and the collection of the data. Second, I shall point out those errors which are commonly made in the editing, classifying and tabulating of data. Finally, I shall consider some errors which occur in the analysis or interpretation of tabulated facts. My text and illustrations will be drawn from the current literature of our field.

1. DEFINING THE SCOPE OF THE INQUIRY, PLANNING THE INQUIRY SCHEDULE AND COLLECTING THE DATA.

A successful investigation must be carefully planned. The problem in mind must be definite and should be stated, if possible, in the general form of a question. This is the method of the worker in the physical, biological and chemical sciences who answers his questions through the medium of the well organized experiment. It should be the ideal of the health investigator to organize his work after the manner of the experimentalist, putting his problems so clearly that only what bears directly on the point at issue will be considered. Yet, it is the rule, rather than the exception, for investigations carried out in the field of public health to be diffuse. Many points are aimed at and nothing hit. Often there is but little concentration of effort on the one matter of paramount importance. Out of the mass of material collected it is hoped that somehow, and at some time, a useful project will be furthered.

The scope of the inquiry having been definitely outlined, the next step consists in planning the inquiry schedule. Many an investigation is ruined in advance because of lack of care in determining upon the form and content of the questionnaire. Nothing can come out of a study that has not first been put into it as a subject for inquiry, and no data will be received unless definitely called for. It is important, however, that the schedule should include only such items as are absolutely necessary to bring out the essential facts of the inquiry. It is better to ask a few pointed questions than to defeat the ends of the investigation by asking too much. Schedules should be well constructed as to form, printing, etc., and should, if possible, not exceed in size the standard letter sheet. The order of items upon the sheet should be arranged so as to economize the time and attention of the persons from whom the facts are to be obtained. Wherever possible, the questions should be so worded as to call for numerical replies or for statements of "yes" or "no". Qualitative replies such as "good", "fair" and "bad" should be avoided, if possible, for such returns involve too much the personal equation of the correspondent or field agent to insure reliability. Wherever indispensable, such qualitative distinctions should not exceed three in number and the limits should be defined and kept clearly in mind. Questions should be worded to present no difficulty of interpretation. For investigations of wide scope it is often necessary to prepare a set of instructions to guide the staff, both in the collection of the data and in its editing and classifying in the office. Such instructions should include the definitions of all important terms used.

Errors in the collection of data are of many types. I shall consider only those that arise out of incomplete registration of the facts. All reports and special studies in public health work are vitally affected by incomplete registration. Thus, death-rates, infant mortality rates and lethal rates for diseases are reliable or unreliable depending upon the accuracy of the registration. A death-rate will be too high if the population is undercounted. It will be too low, if either the population is overestimated or the deaths not all recorded. An infant mortality rate has no meaning if the registration of births is not complete. The lethal rate, say, for a disease like measles, is of little or no value if all the cases are not registered or if the deaths reported are disguised under such terminal conditions as "pneumonia". It is not necessary to give further illustration of this evident source of error. The literature of public health work teems with discussions which are unreliable for the reason that the registration of the primary data was incomplete.

2. Editing, Classifying and Tabulating the Data.

Editing the data is a process of preparing the original statements in the schedules for classification and tabulation. If data are incorrectly or carelessly edited they will not be representative of the original facts. In editing matter for statistical tabulations we must be on the lookout for incomplete, inconsistent, improbable and impossible statements. "Pneumonia," for example, is an incomplete statement of cause of death or of sickness for it may have been "bronchial" or "lobar" pneumonia or it may have been only a terminal condition of some other primary disease to which the case of sickness or death should be charged. "Poland" is an incomplete statement of nativity because the important item of whether German, Austrian or Russian Poland is meant, is not in evidence. "Laborer" is an incomplete statement of occupation because the important item of the industry in which the laborer worked is missing. "Prostatitis" is an example of an inconsistent and impossible statement when the decedent or patient was a female; "endometritis" when male; "married" or "widowed" when statement of age indicates clearly that the subject must have been single. As examples of improbable statements we may take those of extremely rare diseases in localities where it is more than likely that such diseases were not in evidence. It is the practice of the best statistical offices not to accept such statements without further query and such queries often clear up the errors in the original records. The schedule having thus been edited, the material is ready for classification—with one preliminary, however. The material must be divided first into two classes, that which is nominally satisfactory and that which is defective, the latter to be entirely discarded or returned to the original source for correction. Facts in the inquiry schedule which are stated in numerical terms are classified by magnitude. Statements such as occupation, birthplace, cause of death and similar facts are classified by separating the material into as many qualitative groups as are called for by the system of classification used. The classification system should be standard, that is, such as is agreed upon in advance by representative workers in the special field. If the material be statements of cause of death the International List of Causes of Sickness and Death should be used; if it be statements of occupation, the system should be that of the Population Division of the United States Census Bureau; if of accidents, the list recently evolved by the International Association of Industrial Accident Boards and the Bureau of Labor Statistics.

Indifference to the use of standard classification systems virtually destroys the value of much of our social and medical records. Hospital records are notoriously bad in this respect. In the reports of one of the largest hospitals of the country a tabulation of the diseases and conditions treated is presented, not in accordance with the International List, but in accordance with a scheme gotten up in this individual hospital. The cases were classified under several broad anatomical groups and under each of these groups by single terms as given in the original diagnoses. No uniform system of nomenclature or arrangement of titles and terms seems to have been followed. It is clear that a comparison of the records of this hospital with the records of Bellevue and Allied hospitals of New York City which follow standard practice cannot possibly be made. Much the same condition prevails at the present time in the reports of other institutions such as those for the care of the insane, reformatories, prisons, charitable organizations, etc. The chief statistical need of these institutions at the present time is a system of classification for the major items with which they are concerned.

The first essential of a system of classification is that it shall consist of mutually exclusive terms, the limitations of which are definitely established. Yet how often do we find classification systems, usually invented on the spot by isolated workers, presenting categories which overlap. Thus, a recent publication on the causes of street accidents issued by one of the largest cities of the country gave in one table the number of cases due to "carelessness of individual" and the number of cases due to "automobiles and to other conveyances." Other examples of mixed classifications in the field of vital statistics will occur to every one of you.

Tabulation in its simplest form consists in summing up the elements of the several classes into which the material has already been grouped. It is thus the first step in the investigation at which definite numerical answers to the questions of the investigation are provided. For the most part the processes involved are those of elementary arithmetic and I shall take no time to refer to errors which arise in the course of such work, although clerical errors are not at all infrequent or inconsequential. I shall refer rather to table structure as an important element in statistical method. A table is primarily a visualization of the relation between coördinate and subordinate facts. A source of error and confusion in tabulations lies in obscuring such relations. It is very common, for example, to pick up a table and find it impossible to make the several columns sum up to the totals indicated. The difficulty in such cases is not so much that an error in calculation has been made but rather that in the arrangement of the items no effort has been made to distinguish between subordinate and coördinate items. It is also important, in order to avoid misinterpretation, that the form of the table should be as simple as possible. At the utmost, not more than two or three primary classifications of the data should be displayed at one time. Thus, the amount of income per family classified according to income scale may be still further qualified by the characteristic of "number of persons in family". Such complicating factors as "nationality of head of family," "occupation of head of family" or other elements which have a decided effect on the size of income, should be arrayed in other simple tables, where these factors alone are considered. Tables, like classification systems, should follow standard practice.

Under "tabulation" we shall consider a series of derivative concepts which are employed as aids to analysis. Such are "percentages", "averages", including medians and modes, devices for measuring variation from type (the standard deviation) and the degree of correspondence between related groups (the coefficient of correlation). It will take us too far afield to consider each of these devices in detail. I shall refer only to the simplest of them and shall indicate only the commonest errors in their computation and use.

The arithmetical average is the easiest to compute and is the one most often used. It is the ratio between the sum of a series and the number of items in the series. Its utility lies in giving a concise picture of a large group for purposes of comparison with other similar groups. The most frequent error in computing this unit consists in averaging averages. Thus, a prominent writer in the field of public health computed the average lethal rate of scarlet fever for three states by combining the three lethal rates for these states and then dividing by three. This is, of course, a very serious error. According to the definition, the true average lethal rate would be the sum of all the deaths divided by the sum of all the cases reported in all the states. The figure thus obtained is ordinarily very different from the supposed average obtained by the other method. This illustration suggests the use of weighted averages in place of simple arithmetical averages. Thus, a comparison of the cost of living at the present time with that, say, of ten years ago cannot accurately be made unless the increase in the cost of trifling commodities is discounted and the increase in the vital necessities of life is duly weighted. An increase of 50 per cent. in the cost of pepper is of but small importance while an increase of 50 per cent. in the cost of clothing is a matter of serious concern. An index of the cost of living must give due regard to the relative importance of the items which make up such a composite measure. This is accomplished by using the weighted arithmetical average.

The mode must be distinguished from the simple arithmetical average. It points out which item in a series occurs most frequently. It is useful whenever we wish to obtain a picture of the series disregarding the extremes of variation. It is often more useful, for example, to know that workers in a certain industry have a modal wage, let us say, of two dollars per day than that the average wage in the industry is three dollars, when the latter figure results from the inclusion of higher salaries obtained by a small number of persons in managerial or official capacities.

Another statistical form, which serves a purpose in tabulation that cannot be accomplished by either the average or the mode, is the median. Let me illustrate: in 1913, the average age at death for broncho-pneumonia was 19.7 years. Practical experience tells us, however, that this disease is not characteristic of the ages around 20 but that it is found most frequently in infancy and in lesser degree in old age. The disease has two modal points. The average, therefore, is not a good unit to use in this case. The median is used instead; for broncho-pneumonia it is 1.5 years. This tells us that one-half of the deaths occur under age 1½ and that the other half occur over age 1½ years. This agrees more nearly with practical experience. The median may then de defined as the point which divides the total number of cases of a series into two equal parts. It takes into consideration the tendency of groups of cases to congregate at the extremes. Where a series is fairly regularly distributed, following the law of error or chance, the median, the mode and the average have practically the same value.

3. Interpretation and Analysis of Results.

The community is not primarily interested in the methods of science but in its results. The conclusions and interpretations found in reports and investigations in the field of public health are, therefore, of the greatest practical importance, since it is these which determine the direction of definite programmes of action. For this reason, errors in interpretation and analysis of otherwise satisfactory statistical data are most to be avoided. Yet, the gravest errors in the use of the statistical method in public health work are made at this stage. Those who have little or no acquaintance with scientific methods of investigation show considerable modesty in preparing tabulations but few have any hesitation when it comes to drawing conclusions. Almost any one can do that. As a result, as one very competent statistician puts it, "a great deal of our statistical analysis is of a very low grade".

Most errors in interpretation and analysis of statistics are errors of simple logic. There is failure to distinguish whether phenomena are connected, indirectly connected, or apparently or absolutely unconnected. Because events happen to be related in time and space it is often promptly inferred that they bear to one another the relationship of cause and effect. Again, nothing is commoner than that one possible cause is singled out as a sufficient explanation for a whole phenomenon when there are doubtless many other causes at work to determine the effect. A fruitful source of error lies in making comparisons between materials which are not comparable. The saving clause "other things being equal" is only too often overworked; for other things are not equal. Finally, conclusions of the greatest importance are drawn from insufficient data, the element of error involved in small numbers being forgotten.

Karl Pearson, in his now classic essays on how to conduct social investigations, has presented, with a wealth of illustration, the commoner errors of interpretation and analysis in the field of sociological discussion. Mr. Schneider has drawn largely from this and other sources. He has already given excellent examples of fallacies which result from confusing association with causation and also from ascribing to one single cause what is undoubtedly the result of the action of many causes. In the little time at my disposal I shall cite only a very few additional examples of what should be avoided in our reports and discussions. Other examples will probably seem more illustrative to you but those that I quote have arisen in my own field of work.

Serious errors arise from the comparison of tabulations that are essentially imcomparable. There is a constant temptation, for example, to compare the death-rates of cities and of states without regard to the differences in the composition of their populations. A higher crude death-rate in a southern city does not necessarily indicate lower standards of sanitation than prevail in a northern community with which it is being compared; but may result entirely from the high proportion of colored population. The age factor should play an important part in all comparisons between the death-rates of northwestern and eastern cities. I believe that the time is not far distant when we shall be compelled likewise to take into consideration the differences in the race stocks of populations in making comparisons of mortality since this element plays a large part in determining the true death-rate. Similar reservations must be made in comparing rates for certain diseases in different parts of the country. For example, colored persons, while not immune from scarlet fever, are not as susceptable to it as white persons. Consequently, the general scarlet fever death-rate is likely to be low in the registration cities in which the proportion of colored persons is large, although its white population may have a general death-rate for this disease close to that in the registration area as a whole. With whooping-cough the situation is reversed, as colored persons are more susceptible to this disease than whites. Comparisons of this nature, therefore, which do not take into consideration fundamental differences in the composition of the population, are worse than useless, since they give only a distorted picture of the true facts. This inevitably results in misunderstanding and controversy.

Errors arise from a confused idea that proportions based upon deaths from all causes, are somehow equivalent to rates based upon populations. Writers on occupational hygiene have been especially guilty of this fallacy. One writer, for example, deplores the high incidence of tuberculosis among school teachers, intimating that this disease is even more prevalent in this occupation than among stone cutters. His evidence was the Census Bureau tabulation showing a high proportion of tuberculosis in deaths from all causes in this profession. No consideration was given, however, to the important item of the death-rate in relation to the number exposed, this rate being exceptionally low among school teachers. A high proportionate mortality may, therefore, be entirely consistent with a low absolute death-rate from tuberculosis and this is exactly the case in the occupation in question. To state the case more emphatically, we may say that even if all the deaths of school teachers in the age period 25–34 were from tuberculosis, the death-rate from this disease would still be lower than that found among stone cutters.

Another example of this same fallacy appeared in a recent publication of the health department of one of the largest of our cities. In this article, the attempt was made to compare the mortality of children under two years of age according to the nationality of their mothers. The method was very simple indeed. It consisted in comparing the percentage of deaths of the children according to the nationality of their mothers and the percentage of the total population on the same basis. Thus, the American born population constituted 64 per cent. of the total population, whereas only 25 per cent. of the total deaths were babies of American born mothers. The conclusion was, of course, drawn that the mortality of children of foreign parentage was very much higher than that of children of native parentage. No consideration whatever was given in this discussion to the important factor of the birth-rate for the several nationalities. The birth-rate for native Americans is decidedly lower than for Russians, Poles and Italians who are heavily represented in the population of this city. If American born mothers had carried their birth restriction to its logical conclusion, there would have been no deaths at all among their offspring for there would have been no offspring to die. In such event, the numerical disadvantage of the babies of foreign born parentage would have been even more marked.

Finally, I would call your attention to an element of error which arises out of drawing conclusions from relative statistical numbers based upon too few cases. The very definition of statistics predicates reasonably large groups; otherwise the result obtained may be due only to a chance variation with little inherent probability. Averages, rates and other derivative figures are subject to the error of sampling and such errors form a part of their value and indicate the limits between which the true value lies. When the number of cases involved is small, the error is large. Indeed, it may be larger than the value of the average or rate itself. Let me repeat an oft-quoted illustration. We desire to learn the lethal rate of a disease and have the results for only a small number of cases, let us say ten, of which seven recover. The lethal rate (0.30) is not trustworthy as an index of the lethality of this disease. It is undoubtedly true for this particular group of ten, but one cannot generalize from it as to any larger group of cases because it may be only a chance result. The possible error for the ten cases is 0.41 and this is larger than the rate; this is, of course, absurd. If the results in 100 cases rather than ten were tabulated and 70 recoveries followed, the error would be 0.13. If 1,000 cases were studied and the recovery rate were the same, the error would be only 0.04, which is fairly negligible as a corrective, for the lethal rate would range from 0.26 to 0.34. This is sufficiently exact for all practical purposes. In other words, it would be necessary to have 1,000 instances in this particular case before we could draw a conclusion which would be generally true. The accuracy of the result increases directly with the square root of the number of cases. A simple test which is often useful to determine whether the number of cases is adequate to permit general conclusions to be drawn is given by Poisson's formula, which will be found sufficiently illustrated in Newsholme's useful work on Vital Statistics.*

4. Conclusion.

In conclusion, permit me to point out the necessity for extreme caution in the collection, preparation and interpretation of data in public health work. It is important that the future development of the public health movement shall be based only upon sound premises and upon thoroughly trustworthy and competent analysis of the facts. The general public will not support health work or any other social welfare programme which is based upon snap judgment or upon conclusions drawn from incomplete, biased or otherwise defective statistics. We must continually keep in mind the possible reaction of a community which forgets the urgency and efficacy of a health programme and remembers only the errors which have already been exposed in the basic data used to support previous health and welfare enterprises.

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* Newsholme, Arthur. Elements of Vital Statistics. Lond., Sonnenschein, 1889, p. 323.

DISCUSSION.

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The question before this meeting has certainly been ably presented and thus complies with Doctor Dublin's first criterion of a successful study. Little can be added to this excellent presentation save to review certain of the matters discussed from the view point of personal experiences. The present speaker's experiences have dealt with the more general phases of public health work than those under immediate discussion but he recognizes in these discussions common problems and common fallacies. One of the more important of these is the use and misuse of averages. Doctor Dublin has defined the average in mathematical terms but there seems to be needed a new definition which will somewhat restrict the use of the arithmetical mean or average and prevent its serious misuse. Before proceeding to such a definition an illustration or two will be of assistance.

Let us conceive of a swimming pool having a sloping bottom so that the depth ranges from three to seven feet. For the purpose of computing its water capacity, the average depth of five feet gives just as full and complete information as a statement of actual condition. From the point of view of a swimmer diving into the pool, however, the statement of average depth gives no useful information whatever.

A more important and practical case is the following. In stream pollution studies the time of passage of a given particle of water between two points must be determined. It varies inversely as the velocity but the mean time over a period is not inversely as the arithmetical mean of the velocities. Furthermore, the self-purification of a stream is an exponential function of the time so that the actual mean time of passage does not measure the mean amount of purification.

The speaker has used the following criterion for the use of a mean value and for the type of mean to be employed.

With reference to any particular use which is to be made of a set of figures, the true and only permissible mean value is one which may be substituted for all the figures from which it is derived without altering the significance of those figures. This criterion not only restricts the use of the mean but determines the kind of mean to be employed in each case, whether it shall be arithmetical, geometrical, or of some other form, and incidentally indicates that certain sets of figures may have more than one mean value depending upon the particular use to be made of them.

In the case of the swimming pool, for example, if the study is of the water capacity, the arithmetical mean depth may be substituted for each actual depth without altering the result, but for the purpose of the diver this mean is worthless.

In the case of stream flow, the mean velocity for measuring run-off is (with constant cross-section) the arithmetical mean, for this value can be substituted for each actual value without altering the result. For measuring mean time of passage, however, the mean velocity must be taken as the reciprocal of the arithmetical means of the separate velocity reciprocals, a more complicated function, while for measuring mean self-purification, the true mean velocity is a still more complicated exponential function of the individual velocities.

Doctor Dublin has shown how an average of a set of averages may be in error. Cases frequently arise, however, in which the straight average of a set of averages is the correct one and a weighted average incorrect. For example, in sewage analysis the amount of settleable solids is an important item in the determination of sludge production in a stream or tank. It varies with the season and the annual average is required. Monthly average values are obtained based upon from ten to thirty examinations. The straight average of these monthly averages is the best annual average, while a weighted average would give undue weight to those months in which more examinations were made.

In all such cases the criterion presented here indicates the proper kind of average or mean to be used and in particular it shows when a mean should not be used.

Another much abused principle is that of correlation. Mr. Schneider has well illustrated the danger of confusing association or correlation with causation. An equally frequent source of error lies in what Professor Pearson has called spurious correlation. Spurious correlation may be defined as follows. If two independent and, therefore, non-related variables are each correlated with a third variable, they will appear to be correlated with each other. The most common mutually correlating factor or variable is time. Any two sets of phenomena which progress uniformly with the progress of time will bear a spurious correlation to one another even though entirely independent.

Thus a recent writer upon typhoid fever has shown by graphic methods a good correlation between the decreasing typhoid death-rate in the United States and the increasing use of filtered water. Although we cannot doubt the relation between typhoid fever and impure water, it is a sad commentary but true that an equally striking correlation would have been obtained in this case by plotting the decreasing typhoid rate against the increasing use of telephones instead of water filtration.

Another very common mutual correlation factor is space. Suppose an epidemic of typhoid to be actually due to the common use of a public well. It would be localized in the general vicinity of that well, *i. e.*, correlated geographically with a certain location. Now suppose a single milk dealer supplies pure milk to most of the dwellers of that section and serves only that section. His route is also correlated geographically with the same location. It will, therefore, appear by the usual process of epidemiologic reasoning that the epidemic is strongly correlated with the milkman, although we have already assumed his innocence.

Perhaps one further illustration of this point will be useful. The tendency toward geographical localization of pellagra in southern mill towns is distinct and has been employed as an argument in favor of the infectivity theory of this disease. It is quite obvious, however, that the statistics of any city could be employed in this way to demonstrate the infectivity of poverty. In other words we have a space correlation whereby people of one type, race or social position tend to segregate. Tendency to segregate, *i. e.*, space correlation, is also characteristic of infectious diseases, being the more pronounced, the greater the relative importance of direct contagiousness. Therefore, tendency to segregate is a common factor, or factor of mutual correlation, whereby such an attribute as race or poverty, or a non-infectious disease directly correlated with race or poverty, becomes spuriously correlated with infectivity. In seeking for causal relations mutual correlating factors must always first be eliminated.

The speaker ventures to express the belief in closing that more intimate knowledge of statistical mathematics upon the part of health workers will not only prevent fallacious and misleading reasoning but will tend to expedite progress along many important lines of public health endeavors.

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MILK-BORNE INFECTION.

E. R. Kelley, Boston (*Journal A. M. A.*, December 30, 1916), says that when the subject is approached in an impartial manner, it is astonishing to see how little real basis there is on which to form any definite estimates as to the quantitative importance of milk infection as compared with other modes of infection. Milk-borne infection is of importance in the United States in five diseases: diphtheria, scarlet fever, septic sore throat, tuberculosis and typhoid fever. Tuberculosis presents a separate problem from the rest. The evidence that incriminates cow's milk as a factor in the transmission of tuberculosis to human beings is now quite conclusive. Nevertheless, the data as to its quantitative importance are comparatively scanty on account of the difficulty of determining whether it is the human or the bovine type that is the active factor. Leaving tuberculosis aside, it ought to be much easier in the case of the four other diseases. Careful and thorough adherence to the laws of epidemiology, supplemented by equally careful and thorough laboratory investigations, will in the majority of cases in epidemics prove conclusively whether or not they can be attributed to milk infection, but there are apparently few health departments in the United States that do determine this even in a roughly accurate way. The usual investigation is carried out only so far as to establish a suspicious frequency of infection in persons having a common milk supply, and the epidemic is promptly labeled as due to milk on insufficient evidence. In order to definitely declare any disease milk-borne, however, it is necessary to carry out by epidemiologic and laboratory means a careful search for and detection of the disease or a past history of the disease in a person or persons handling the milk at any point, and a thoroughgoing exclusion of all other probable channels of infection. He supports these views by figures, and especially by Massachusetts statistics. Analysis of these demonstrates that in only 0.03 per cent. of cases was the transmission of diphtheria definitely assigned to infected milk, and in only 0.19 per cent. was milk either proved or suspected; 1.6 per cent. of the cases of scarlet fever were definitely attributed to milk infection, and 1.8 per cent. proved or suspected; in 79 per cent. of the cases of septic sore throat (not reportable in Massachusetts until 1914) milk was assigned as the cause, and in 6 per cent. of the cases of typhoid milk was either proved or suspected to be the agent of infection in this disease. Taking all of these diseases in a group, 3.9 per cent. were definitely attributed to milk, and in 4 per cent. of all the cases milk was proved or suspected. Considering mortality, 3 per cent . of typhoid deaths are possibly attributable to milk, 0.08 per cent. of diphtheria deaths, 0.8 per cent. of scarlet fever deaths, and 98 per cent. of septic sore throat deaths. Massachusetts' experience, he says, would seem to indicate that even in raw milk supplies under widely differing conditions of supervision, diphtheria transmission through milk is so rare as to be negligible, and the transmission of scarlet fever, while much more common than diptheria, is of very small percentage significance. Typhoid fever has been reasonably attributed to milk in a much larger number of cases, but these all amounted to only 5 per cent. of the total cases reported. Septic sore throat is par excellence the milk-borne disease, but its occurrence is fortunately relatively rare. When it does occur it is usually in epidemics, and is of more serious consequence. In all probability, the menace of tuberculosis is the best excuse we have as practical sanitarians for the amount of propaganda that has been carried on and the money that has been expended by health authorities for the control of milk supplies, so far as such supervision aids the suppression of communicable disease.

A SURVEY OF DAIRY SCORE CARDS.

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History.

THE first dairy score card was constructed by Dr. William C. Woodward, Health Officer of the City of Washington, D. C., in the year 1904. In the next year Prof. R. A. Pearson of Cornell Agricultural College arranged a score card for use in New York State. In 1906 Prof. C. B. Lane of the United States Department of Agriculture published a score card with the idea of more fully meeting conditions in all parts of the United States. This card was immediately adopted in several cities, and after a number of modifications was so perfected that it was used in hundreds of cities and most states. In its final modification it was drawn up by a committee appointed to standardize a national score card. This committee was appointed by the National Association of Dairy Instructors and Investigators. Besides the above cards several cities and states devised dairy score cards of their own, for example: New York City; Richmond, Va.; State of New Jersey; and the City of Washington, which has adopted later editions of Doctor Woodward's score card.

Application and General Uses.

It is believed by some authorities that the score card has been the greatest single factor in improving the milk supply in many localities. "The dairy score" is an expression which has crept into the official milk regulations of municipal departments of health, and today milk regulations are considered incomplete unless specifications are included regarding the scoring of dairies in accordance with some recognized score card. The majority of cities and states have adopted for use the so-called official score card above referred to. Richmond, Va.; Seattle, Wash.; Portland, Ore.; Montclair, N. J.; are places notable for the excellence of their milk supply and the sanitary condition of the dairies in which the milk is produced. The health officers of these places have for years made a practice of scoring dairies by the score card system, and have gradually improved sanitary conditions until they have reached a very high degree of excellence.

On the other hand, there are cities in which the scoring of dairies by the score card system has been made a matter of minor importance. In some of these the milk supply has been improved by other means. Among these may be mentioned the City of Brockton, Mass., where, chiefly by the application of laboratory testing, the milk supply is superior in excellence to that of any other city in the state. In this city the score card has been made a matter of minor importance, the emphasis being laid on the character of the milk itself.

The campaign for milk improvement has brought many municipalities face to face with the question as to whether they can get the best results by spending the money appropriated for milk control in the scoring of dairies, or otherwise. This fact justifies a careful consideration of the value of score cards, particularly as they affect the character of municipal milk supplies.

A COMPARISON OF DIFFERENT SCORE CARDS.

It is possible to compare the different score cards now in use by a tabulation in which every detail of the equipment and methods referred to on these cards is written down in column formation. Some cards include items which others omit, but after a complete list of all of these details has once been constructed it is possible to set down the items mentioned in each card and the value of the same opposite the proper places in such list. I have selected for this comparison the following score cards: Washington, D. C.; the so-called official United States score card; Richmond, Va.; New York City; the State of New Jersey; and Cornell University.

The items mentioned by the different score cards can be roughly divided under the general headings of "Equipment" and "Methods." On the subject of "Equipment" the details given by the different cards are subdivided into a total of seventy-seven different subjects. In the same manner, the details discussed under the general heading of "Methods" deal with eighty-six different subjects. While the whole tabulation is too voluminous to be given in detail, as an example of the method I have used in tabulating the different cards, I give below the single subject of the equipment of cow stables:

COW STABLES.

	Washington.	Official U. S.	Richmond, Va.	New York City.	New York State.	Cornell Univ.
Location elevated ground		1	3			2
No contaminating surroundings	1	1				2
No stagnant water, privy, or hog pen within 100 ft.				1	1	
Cow yard properly graded and drained						6
Ceiling tight and dustproof				2	2	1
Smooth tight walls and ceiling	2	1				1
Floors tight, sound, and proper gutter		2	5			
Floors other than cowbeds concrete or non-absorbent				2	3	
Floors properly graded and water-tight				2		
Cowbeds concrete or planks on concrete				2		
Drops concrete, stone or non-absorbent				2	4	
Drops water-tight, and space beneath clean and dry	4	4		2		
Proper stall tie and manger		1				
Separate quarters for cow calving or sick				1	2	1
No direct opening to silo or grain-pit				1	1	
Running water within building				1		
Livestock other than cows excluded				2	1	1
Bedding		1				

The Washington card does not include the health of cattle, that subject being assigned to a separate score card of its own. On all other cards the health of cattle is included. The New York City and the official United States cards divide subjects into equipment and methods, while the Washington, Richmond, State of New Jersey, and Cornell University cards make no such division. Two cards mention the health of employees, while the other four do not. The variation in the list of detailed subjects is great, but the variation in values allowed is even greater. For example, one card allows for the sterilization of utensils by steam one point; while another allows ten points. Again, one card allows one point for small topped milking pails, while another card allows ten points for this item.

By a system of percentages it is possible to transform the values given by all six of these score cards so that they will be proportional, and comparable with each other. Once this is done, summaries can be made and averages taken which will show to which subjects the greater values are given, and to which the lesser. All of the subjects treated can be collected under certain broad heads. In this way I have drawn up a complete summary of these score cards. The results are shown in the following tabulation:

SURVEY OF SCORE CARDS.

EQUIPMENT.	Average.	Low.	High.	METHODS.	Average.	Low.	High.
Stables, yard, etc.	20.3	11.4	31	Stables (clean)	11.0	7	18
Utensils	7.3	4	13	Cows (clean)	9.1	6	14
Milk house	6.6	4	14	Cooling and refrigeration	9.0	4	15
Water supplies	6.0	2	12	Cows' health	7.5	5	11
Privy	.66	0	4	Utensils (clean) (sterile)	8.0	3	10
				Milking	5.3	3	8
				Transportation	4.0	2	7
				Employees' health	3.6	1	9
				Cow yard (clean)	2.7	1	5
				Manure (disposal)	2.6	2	4
				Milk house (clean)	2.0	1	3
				Employees (clean)	1.8	1	3
				Cow feed	1.5	1	3
	40.86	19.4	74		68.1	37	110

These values do not foot up in their average to exactly 100 points, although in each individual card they have been calculated on that basis, for the reason that the numbers in each case represent the averages of all six cards. The average column gives the averages of the values contained in all six cards. The other two columns show the lowest and the highest values allowed by any card.

It is worthy of note that under the head of "Equipment" the cow stable is given values equal to about one-half of the total subjects considered.

Under the head of "Methods" the cow stable plus the cow yard and manure make a total of 15.6, which is by far the largest item in the list.

RELATION OF SCORE CARD TO THE CHARACTER OF THE PRODUCT.

The object of score cards, while it appears to be the improvement of the sanitary conditions of the dairy, is, as a matter of fact, the improvement of the sanitary condition of the milk itself. If the use of a score card by dairy inspectors fails to improve the sanitary character of milk the expenditure of time and money in dairy scoring would not be justified. The question has been raised as to just what relationship the scoring of dairies bears to the sanitary character of milk. Numerous comparisons have been made from time to time between dairies which have high scores, and dairies which have low scores, and the milk produced in these two types. In addition to this, at some of the agricultural experiment stations laboratory tests of the milk have been accompanied by modifications of equipment used, and of the dairy methods pursued, with a view to ascertaining just what effect such modifications might have on the bacterial content of the milk. These studies may be called intensive studies, because in each case they have been limited to work in one dairy, or to some one phase of the subject.

Another way to ascertain the relation of the score card to milk character is by extensive studies. These include a survey of statistics covering large groups of dairies, and numerous tests of municipal market milk at different stages in its history. The variation in local conditions, and in the factors which influence the character of an individual milk supply, make statistical studies of large groups of dairies of special value in securing a foundation for broad principles. Statistics in sufficient volume smooth out incidental variations, and give an impressionistic view which furnishes a true picture of the real values which should be given to sanitary measures.

Laboratory studies of milk from large groups of dairies, accompanied by the application of first one and then another sanitary method, make possible a comparative measurement of the effect of these different factors on the total volume of milk produced. The writer has compiled statistics of laboratory tests of city milk and milk from country dairies for a period of years. Some of the supplies represent milk carelessly handled; others milk which has been handled with the utmost care. From these statistics, which are very voluminous, I have selected a few representative samples.

CITY MILK.

Samples taken from receiving tank of a large bottling station in New York City:

	Average.
August, 1913	3,140,000 bacteria per cc.
August, 1914	2,026,000 bacteria per cc.

From the same dealer, same tank:

	Average.
January, 1913	394,000 bacteria per cc.
January, 1914	415,000 bacteria per cc.

These figures are averages of all tests taken during the month and represent the difference between summer milk and winter milk in New York City, being the mixed milk of several hundred farmers. Winter weather alone is primarily responsible for the reduction noted.

COUNTRY MILK FROM THREE TYPES OF SHIPPING STATIONS.

Shipping Station Type.	Farmers.	*August, 1913.* Bacteria per cc.	*February, 1914.* Bacteria per cc.
No. 1	15	1,783,000	189,000
No. 2	28	259,000	35,000
No. 3	22	185,000	12,000

The above represent the averages of groups of samples taken from the mixed milk of all of the farmers delivering milk to these large shipping stations during the month of August and during the month of February. The contrast between the bacteria summer and winter are believed to be chiefly due to differences of temperature. On the other hand, the contrasts between the bacteria in the three types of stations are chiefly due to different degrees in sanitary care exercised by the three groups of producers.

COMPARISON OF MORNING'S MILK AND NIGHT'S MILK.

Date.	*Morning's Milk.* Bacteria per cc.	*Night's Milk.* Bacteria per cc.
November, 1915	118,000	313,000
January, 1916	283,000	773,000

These figures represent the summary of samples taken from 56 farmers at one large shipping station, the figures being averages. The difference is believed to be largely due to multiplication of bacteria over night, the cooling of milk being dependent only on spring water.

EFFECT OF ICE ON FRESH COUNTRY MILK.

Date.	*New York state milk, cooled with ice.* Bacteria per cc.	*Pennsylvania milk, cooled with spring water.* Bacteria per cc.
June, 1915	9,500	80,000
August, 1915	9,440	73,000

The above figures represent in the instance of New York State the average of bacteria in the mixed milk of 70 farmers; in the case of Pennsylvania in the mixed milk of 93 farmers. In both stations unusually good sanitary precautions are observed under an identical system of control, the essential difference between the two places being only the use of ice for cooling in the case of the New York State milk, and spring water for the Pennsylvania milk. In both cases the samples were taken from night's milk.

THE SANITARY FACTOR.

By a comparison of two milks which are so fresh that refrigeration is not a consideration, it is possible to compare the value of other factors. Thus, at a large shipping station in Pennsylvania patronized by over 90 farmers tests were made for the month of August and September, 1914, on milk from dairies, at least three times a week, and for the same two months in the year 1915. In both cases samples were taken of morning's milk within less than four hours of milking, so that there was little, if any, multiplication of bacteria. The average of all results for these two months from all producers was as follows:

A COMPARISON OF FRESH MORNING'S MILK.

	Bacteria per cc.
August and September, 1914	393,000
August and September, 1915	55,000

The only difference between conditions consisted in the establishment of certain sanitary precautions in milk production, such as covered milking pails, clean hands, and clean udders, and sterilization of utensils.

Another and most striking instance of the value of the sanitary factor in fresh country milk is shown by the tabulation below:

BACTERIA IN MILK FROM TWENTY DAIRY FARMS, FAR HILLS, N. J. (1916).

Farmer.	Bacteria per cc.			
	Aug. 14.	Aug. 21.	Aug. 28.	Sept. 7.
No. 1	12,000	23,000	22,000	143,000
2	33,000	62,000	39,000	186,000
3	124,000	14,000	22,000	260,000
4	260,000	33,000	41,000	25,000
5	23,000	28,000	146,000	222,000
6	86,000	28,000	54,000	143,000
7	220,000	96,000	42,000	46,000
8	14,000	29,000	92,000	110,000
9	21,000	46,000	22,000	38,000
10	260,000	86,000	175,000	18,000
11	70,000	590,000	93,000	520,000
12	95,000	36,000	23,000	16,000
13	240,000	68,000	45,000	68,000
14	63,000	64,000	21,000	74,000
15	160,000	85,000	92,000	69,000
16	300,000	740,000	210,000	460,000
17	130,000	268,000	40,000	12,000
18	9,000	7,000	7,000	1,000
19	80,000	275,000	23,000	63,000
20	93,000	16,000	12,000	133,000

In the above table the figures are the results of the bacterial counts on samples of milk taken from cans as received at the shipping station. Most of the dairy barns are of a very ordinary type. One of the most ordinary is that of producer No. 18, and yet the milk from these premises shows by far the smallest numbers of bacteria. Investigation revealed the fact that this producer with the help of his wife was carrying out the following precautions:

(1) Milking pails and cans scrubbed with brush and alkaline powder;

(2) Milking pails and cans scalded with an abundance of boiling water provided twice daily;

(3) Strainer clothes boiled twice daily more than two hours;

(4) Hands of milker washed and dried before milking;

(5) Cow's udder washed and dried before milking.

This was the only dairy in the entire list carrying out all of these precautions. This milk was cooled only with spring water.

THE COW STABLE AND ITS SURROUNDINGS.

Much has been written regarding the importance of sanitary conditions in the cow stable. Tests were conducted by the writer for a whole year on samples taken at least three times a week, and often daily, and averaged for each month, from milk produced in a most model sanitary cow barn, and in a very old and unsanitary stable. The milking operations in both barns were conducted in a careful manner, and milk was also carefully cooled. Such factors as the cow yard, the manure pile, light, ventilation, air space, floors, walls, ceilings, etc., were in a most unfavorable condition in the old stable. Covered milking pails were used in both barns, cows' udders clean, milkers' hands washed, and milking carefully done. The results were as follows:

Date.	*Sanitary Barn.* Bacteria per cc.	*Old Barn.* Bacteria per cc.
September, 1903	660	1,950
October	354	331
November,	287	425
December	505	457
January, 1904	355	1,244
February	1,721	3,910
March	690	4,200
April	3,300	4,600
May	1,950	10,200
June	550	1,900
July	1,260	3,500
August	1,534	4,610
Average	1,097	3,102

These results would seem to show that the cow barn, cow yard, manure pile, etc., are of only minor importance in so far as any direct effect on the character of milk itself is concerned.

THE HUMAN FACTOR.

In a certain dairy district in Pennsylvania ten dairy barns in a most unsanitary condition were selected for experimental purposes. The experiment consisted simply in changing milkers. The same cows, the same barns, the same milk cans, the same cooling facilities were used. In the first instance, bacterial tests were made for one week on samples of milk produced by the resident milkers. At the end of that time, on ten of these dairies, milkers who had been trained in sanitary methods were imported from another dairy district. They brought with them covered milking pails. They practiced such sanitary precautions as could be carried out without any changes whatever in dairy equipment, other than the covered pails. These methods included the use of boiling water for sterilizing, and the milking with dry hands. The hands were not washed, and cows' udders were not washed. In every case the cooling of milk was done only in tanks of spring water in forty quart milk cans. This test occurred in the month of April, 1915. The following results were obtained:

	Local dairymen. Bacteria per cc.	*Imported dairymen.* Bacteria per cc.
	1,830,000	3,300
	1,520,000	3,100
	4,830,000	4,600
	4,000,000	7,000
	1,450,000	4,100
	3,600,000	800
	....	2,500
	70,000	1,600
	500,000	5,600
Average,	1,948,000	9,360

These results indicate that when measured by its influence on milk character the human factor far exceeds all others in its importance.

COVERED MILKING PAILS.

Numerous experiments have been made to determine the efficiency of covered milking pails. Several years ago at the Experiment Station at Storrs, Conn., experiments of that kind were made. These have shown a reduction of from 75 per cent. to 90 per cent. in bacteria under ordinary working conditions. It is obvious that the falling dust during milking time which passes through the mouth of a milking pail will be proportional to the size of the opening. If the size of the opening is reduced 90 per cent. the quantity of dust falling into milk will be reduced

90 per cent. It is easily possible to construct a milking pail so covered that an opening convenient for milking will expose the pail to only 10 per cent. of the droppings usually falling into the wide mouthed type. As an illustration of what happens by the substitution of covered pails for other milking pails in the hands of ordinary dairy farmers, I submit the tabulation below:

Farmer.	*Bacteria Per CC.*		
	Feb. 15 to Mar. 14.	Mar. 15 to Mar. 31.	Apr. 1 to Apr. 15.
No. 1	258,000	89,000	31,600
2	541,000	185,000	50,000
3	278,000	35,000	17,600
4	445,000	113,000	11,300
5	237,000	32,000	17,500
6	821,000	380,000	99,000
Average	430,000	139,000	37,830

(These figures were secured by a local laboratory testing milk delivered to a shipping station at Sparks, Md.)

The column from February 15 to March 14 represents the bacteria in the milk of these six farmers for one month previous to the use of covered pails. The column March 15 to 31 represents the bacteria in the milk for two weeks after receiving covered pails. The third column, April 1 to 15, represents the addition of another factor, namely, extra care in boiling and sterilization of utensils.

Sterilization of Utensils.

It is obvious that the degree to which unclean or unsterilized utensils affect milk must vary greatly in accordance with the extent to which utensils are soiled, consequently this factor can scarcely be fixed. As an illustration of a very extreme damage to milk by dirty cans I submit the tabulation below:

	Bacteria per cc.
Mixed milk of 60 farmers delivered to a shipping station in New York State	5,000,000
Same milk after pasteurization	6,700
Same milk after 3 minutes in 40-quart milk cans	560,000
Water in which milk cans were rinsed	1,270,000
Milk from same cans on arrival in New York City the following day	12,000,000

(This shipment consisted of 400 40-quart cans of milk, all of which was sour on arrival in the city.)

The substitution of a clean rinse water, and a proper system of sterilization for the cans entirely remedied the trouble.

Covered milking pails, sterilization of utensils, and cooling milk, as factors are further illustrated by the tabulation below. This shows the bacteria in 3,000 quarts of mixed milk of twenty-eight farmers delivering milk to the same shipping station.

Date.	Bacteria per cc. in 3,000 quarts mixed milk.	Remarks.
1914.		
Dec. 26	5,500,000	Bacterial tests commenced.
31	3,000,000	
1915.		
Jan. 6	1,000,000	
13	500,000	Freezing weather.
22	800,000	
29	800,000	
Feb. 5	800,000	(Moral effect of bacterial tests.)
12	900,000	
19	1,000,000	
26	700,000	
Mar. 5	700,000	
12	250,000	Covered milking pails distributed.
19	250,000	
26	80,000	Pails and cans sterilized.
Apr. 2	100,000	
9	70,000	
16	35,000	Premiums paid for bacteria.

The several tabulations which have been submitted above show the influence of the following factors on the bacteria in milk:

Factors.	Effect.
1. Temperature	
(a) Winter versus summer weather may reduce bacteria	90%
(b) Ice water versus spring water may reduce bacteria	90%
(c) Morning's milk versus night's milk may reduce bacteria	60%
2. Covered milking pails may reduce bacteria	90%
3. Sanitation (minus cooling) may reduce bacteria	87%
4. Sterilization of utensils may reduce bacteria	99%
5. Type of producer at shipping stations may reduce bacteria	84%
6. The human factor may reduce bacteria	99.99%
7. The cow stable and surroundings may reduce bacteria	less than 1%

The above values are not believed to indicate exactly the relative importance of the factors mentioned. They represent the extremes, which are modified by local conditions. But they do show in a general way where the emphasis should be placed and where it should not be placed.

The fact that very large volumes of clean milk can be secured by the practice of only a small number of precautions carefully selected from the large list included in the score cards is abundantly demonstrated by the large milk shipping stations now producing Grade A milk for New York and other cities. The bacterial tests of the milk from individual dairies, and of the mixed milk from these stations which have been made for a period of years amount now to many thousands of tests for each of these stations. Below I have tabulated the averages of the mixed milk of a number of stations operated under my personal supervision, showing the change which has taken place in milk character as a result of the application of elementary sanitary methods by the milk producers.

These five large milk shipping stations handle over 30,000 quarts of milk daily. In each one of them the character of the entire volume of milk has been transformed from an unsanitary product, containing millions of bacteria; to a sanitary product, con-

GENERAL EFFECT OF A FEW ELEMENTARY SANITARY METHODS ON BACTERIA IN LARGE VOLUMES OF MIXED MILK.

Shipping station.	Number of dairymen.	Volume of milk, quarts daily.	Bacteria per cc. before adoption sanitary methods.	Bacteria per cc. after adoption sanitary methods.
Homer, N. Y.	70	12,000	500,000	10,000
Sparks, Md.	28	3,000	5,000,000	40,000
Oxford, Pa.	135	10,000	2,000,000	40,000
Kelton, Pa.	56	4,000	3,000,000	25,000
Fair Haven, Vt.	20	1,200	1,500,000	25,000

taining a few thousands of bacteria. These figures have a significance far beyond the figures that can be secured from a single dairy, since over three hundred dairy farms are represented. The work has been done in large volume and on a wholesale basis. It is truly statistical in character. The bacterial tests are made daily by local laboratories, and include, not only tests of the mixed milk, but of each individual producer. The tabulations of these records show conclusively the change from unsanitary milk to sanitary milk in the product of the individual dairies as well as in the mixed milk of all.

In each of these stations the sanitary methods adopted and the system of control established have been the same. The methods have consisted in the following:

(1) Milking with clean, dry hands, into covered pails from udders free from loose dirt;

(2) Sterilization of pails, cans, strainers, etc. with boiling water;

(3) Cooling milk by submerging cans in tanks of spring water or ice water.

The control has consisted in each case in:

(a) The taking of samples at shipping stations for frequent bacterial tests; (at least three times per week);

(b) The payment of the producers of premiums; (10c or 20c per 40-quart can for milk testing below the bacterial standards established, 25,000 to 10,000 per cc.).

The complete transformation in five different localities of such large volumes of milk produced by so many dairy farms justifies the conclusion that the sanitary measures employed must be nearly fundamental.

The Relation of Milk Quality to Score Cards.

The Virginia Agricultural Experiment Station, Bulletin No. 194, September, 1911, states: "that the score card is defective when used as a measure of the sanitary properties of milk," and, "that it is entirely practical to admit dairies scoring very low, which show a uniformly low count," and publishes experimental data to prove this.

The New York Agricultural Experiment Station, Bulletin No. 398, March, 1915, also deals with the same subject, and concludes that: "The present score cards cannot be satisfactorily used as a means of grading milk according to quality" for the reason that "a large number of the items included on the score card have little or no effect upon the number of bacteria present in the milk."

As a further illustration of this point, I submit the record of dairy scores and bacterial tests made on twenty-four dairy farms at Homer, N. Y.

In the tabulation below there is only slight variation in the bacterial tests of milk. All of the milk is very low in bacteria. The milk from the dairy having the highest score, and from the dairy having the lowest score, in each case contained 2,200 bacteria per cc.

I submit also the records of dairy scores and bacterial tests of Sparks, Maryland. In this dairy district the farmers are not supplied with ice, and

DAIRY SCORES AND BACTERIAL TESTS —HOMER, N. Y., 1911.

Farmer.	Score.	Bacteria per cc.
No. 1	81.85	2,200
2	81.45	3,000
3	80.55	3,400
4	80.35	2,000
5	80.35	2,200
6	79.80	1,500
7	79.20	2,800
8	78.05	3,600
9	77.75	2,300
10	76.35	2,500
11	75.95	2,400
12	74.40	3,400
13	74.15	4,800
14	73.60	3,000
15	73.60	2,800
16	72.60	4,000
17	71.05	3,600
18	70.55	4,000
19	69.80	2,400
20	67.55	2,300
21	66.05	6,600
22	64.55	21,000
23	64.00	4,000
24	59.00	2,200

(The scoring was done by representatives of the Bureau of Animal Industry, United States Department of Agriculture, using the official score card. The bacteria are averages of tests three times a week for month of August, when scoring was done.)

the dairies as a class do not score so high as those in New York State.

DAIRY SCORES AND BACTERIAL TESTS —SPARKS, Md., 1913

Farmer.	Score.	Bacteria per cc.
No. 1	77.50	50,000
2	73.65	11,000
3	68.65	17,600
4	66.25	29,000
5	66.20	18,000
6	64.00	98,000
7	58.70	98,000
8	58.05	64,000
9	57.60	43,600
10	53.60	32,000
11	52.50	38,000
12	51.25	84,000
13	50.35	37,000
14	59.40	54,000
15	46.25	48,000
16	44.05	24,000

(In this case the dairies were scored by the chief dairy inspector of the City of Baltimore, using the United States official score card. The bacterial tests are averages for the month of April, 1913, when the scoring was done.)

In the above tabulation it is obvious there is not definite or even general relationship between dairy scores and bacterial counts. The highest scoring dairy ranks twelfth in bacterial standing, while the lowest scoring dairy ranks fourth.

Numerous other tabulations could be furnished showing how elastic is the bacterial count, making it easily possible for dairies with low scores to produce milk with very small numbers of bacteria. In short, there is no monopoly by model dairies of the sanitary methods vital to clean milk production, and consequently clean milk production is a possibility for even the poorest dairy farmer.

Demand for a New Type of Score Card.

The very life of the dairy score card is threatened unless it can be shown that it does give some reasonably close indication of the character of the product coming from the dairies which are scored.

Bacterial testing is increasing in popularity. The multiplication of bacterial laboratories in the milk industry and in municipalities is laying more and more emphasis on the product, and less and less on the dairy. In recent years the pendulum has swung strongly from the dairy to the product itself.

The grading of milk into several grades—A, B, and C—lays most of the emphasis upon the product as delivered to the city. The labels on the retail packages carrying the letters, A, B, and C, are intended to convey to the consumer information concerning

DAIRY SCORE CARD FOR PRODUCING SANITARY MILK.

(In this card it is assumed that no milk will be used from dairy cows which have any disease or have sore udders, and that dairy employees will be free from infectious diseases, and will not be carriers of disease germs. Veterinary supervision of cows and tuberculin testing, and medical inspection of employees are necessary where milk is to be sold in a raw state.)

	PRIMARY EQUIPMENT. (Total 30.)	
MILKING.	Milking pails are of small mouth design, top opening not exceeding 6 inches in diameter	5
	Milk pails are of metal, smooth, in good repair, and have all seams soldered flush	1
	Milk cans are of metal, smooth, in good repair, and have all seams soldered flush	1
	Milk can lids are of metal, smooth, in good repair, and have all seams soldered flush	1
	Strainers are of cotton, new for each milking held in place by a good sanitary holder, or are of fine cheese cloth (no wire or metal strainers are used)	2
COOLING.	Ice supply is sufficient for entire season	5
	Water supply is pure, abundant, and cold	2
	Cooling tanks of cement or metal or wood have capacity for milk cans and depth to bring water to neck of cans	2
	(No open or exposed coolers are used except in protected milk room)	
	Stirring rods are of smooth metal and in good condition	1
STERILIZING.	Boiling water supply (or steam supply) for sterilizing is abundant	6
	Alkali washing powder is supplied	2
	Scrub brushes for cleaning cans and pails are supplied	2

	PRIMARY METHODS. (Total 60.)	
MILKING.	Udders and teats of cows are kept clean before milking	4
	Milker's hands are clean and kept dry during milking	5
	Small mouthed milking pails only are used for milking	10
	Milk is strained in clean atmosphere through cotton or fine cheesecloth	1
COOLING.	Milk is cooled by placing cans in tank of ice water to below 50° F. within three hours after milking	20
	Or by placing cans in tank of cold running water to below 55° F. within three hours after milking	15
	Or in tanks of standing water to below 60° F. within three hours after milking	5
STERILIZING.	Utensils are rinsed with clean cold water immediately after using	2
	Are scrubbed with brushes and solution of alkaline washing powder and are rinsed with clean water	3
	Are sterilized with an abundance of boiling water or steam	10
	Strainers are washed in alkali solution and boiled for at least 30 minutes	5

	SECONDARY EQUIPMENT. (Total 3.30.)		
	COW STABLE (LOCATION AND CONSTRUCTION)		2 0
1	Cow stable is located on elevated ground	0.10	
2	Cow stable has no stagnant water, hog pen, privy, uncovered cess-pool or manure pit within 100 feet	0.10	
3	Cow stable ceiling is smooth and tight	0.10	
4	Cow stable walls are smooth and tight	0.10	
5	Cow stable floors are smooth and water tight and non-absorbent	0.20	
6	Cow stable floors are properly graded and drained	0.10	

	SECONDARY METHODS. (Total 6.70.)		
	COW STABLE		1 50
1	Interior kept well painted and whitewashed	.15	
2	Ceiling free from dirt and cobwebs	.12	
3	Walls and ledges free from dust and dirt	.10	
4	Windows washed clean	.10	
5	Feeding troughs lighted and clean	.12	
6	Floors free from dirt	.15	
7	Premises free from rubbish	.15	
8	Cow beds clean, dry, no loose manure	.12	

7	Cow stable drops are tight and non-absorbent		0.20	
8	Cow stable drops are well drained		0.10	
9	Cow stable has proper stall tie and manger		0.05	
10	Cow stable has live stock other than cows excluded		0.05	
11	Cow stable has separate quarters for sick and calving cows		0.10	
12	Cow stable has abundant pure running water within the building		0.20	
	COW STABLE (AIR AND VENTILATION)			
13	Cow stable has 600 cu. ft. space or more per cow		0.10	
	Cow stable has 500-600 cu. ft. space per cow	.008		
	Cow stable has 400-500 cu. ft. space per cow	.005		
	Cow stable has less than 400 cu. ft. space per cow	.000		
14	Cow stable has controllable flue ventilating system		0.10	
	Cow stable has windows hinged at bottom	.008		
	Cow stable has sliding windows	.006		
	Cow stable has other air openings	.004		
15	Cow stable has stable air good Cow stable has ventilation sufficient)		0.20	
	Cow stable has ventilation fair	.1		
	Cow stable has ventilation poor	.000		
	COW STABLE (Light)			
16	Cow stable has 2 sq. ft. window light for each 600 cu. ft. air space		0.20	
	Cow stable has 4 sq. ft. of glass per cow	.2		
	Cow stable has 3 sq. ft. of glass per cow	.1		
	Cow stable has 2 sq. ft. of glass per cow	.05		
	Cow stable has 1 sq. ft. of glass per cow	.005		
	MILK HOUSE (LOCATION AND CONSTRUCTION)			1.0
1	Separate from cow barn		0.08	
2	No contaminating surroundings		0.10	
3	Walls and ceilings smooth		0.06	
4	Floors smooth, water tight and graded		0.06	
5	Washroom separate from milk room		0.06	
6	Sufficient light		0.06	
7	Sufficient ventilation		0.06	
8	Properly screened to exclude flies		0.08	
9	Sufficient supply pure running water		0.10	
10	Steam facilities		0.10	
11	Hot water facilities		0.10	
12	Hand washing facilities		0.08	
13	Dressing room and cleaning milking suits		0.06	
	PRIVY			.30
	Location isolated		0.10	
	Location safe		0.10	
	Construction, earth closet	.05		
	Construction, pail closet	.05		
	Construction, tight cement, cess pool closet	.10		
	Properly screened		0.10	

9	Cow bedding clean, dry, absorbent	.12	
10	Stable air free from dust	.15	
11	Stable air free from odor	.10	
12	No dry or dusty feed used before milking	.12	
	COW YARD		.50
	Well drained	.10	
	Clean and free from manure	.30	
	No stagnant water	.10	
	MANURE		.50
	Removed from stable daily	.30	
	Removed at least 100 feet	.20	
	Removed at least 50 feet	.10	
	Removed less than 50 feet	.00	
	MILK HOUSE		1.
	Milk room clean	.40	
	Milk room free from flies	.30	
	Milk room free from rubbish	.30	
	EMPLOYEES		.70
	Clothing clean	.20	
	Clean white milking suits	.30	
	Clean white caps	.20	
	COW FEED		.20
	Clean, wholesome	.05	
	Good quality	.05	
	No distillery waste used	.05	
	No putrifying food	.05	
	PRIVY		.80
	In good sanitary condition	.20	
	Vaults and seats covered and protected	.20	
	No access of flies	.20	
	Contents properly disposed of	.20	

SUMMARY

Primary Equipment	30
Primary Methods	60
Secondary Equipment	3.30
Secondary Methods	6.70
Total	100.00

the sanitary character of the contents. It has become obvious that the old score cards cannot be used as a basis for this grading system, but that the bacterial test furnishes a much more secure foundation for the separation of milk into grades.

A New Score Card.

I am not among those who advocate the use of a dairy score card because "it gives dairy inspectors something to do." Milk inspection has fallen into evil days if dairy scoring must be performed for its own sake and not because of any direct effect on the character of the product.

Even "educational value" is too vague and questionable in its nature to justify the expenditure of the municipal appropriation in dairy scoring. Dairy scoring cannot hope to hold its position as a service at public expense unless it can be shown that the service is directly reflected in an improvement, not only in the appearance of dairies, but in the condition of the milk which the citizens drink. There must be a direct connection between cause and effect. This can be secured only by focusing the attention of the dairy inspector more accurately on those things which are of primary importance in clean milk production, rather than to distribute his attention over a long list of subjects which are only incidental or even of negligible importance.

Factors of Primary Importance.

From the statistics in the fore part of this article it is obvious that the long list of items in the best score cards can be separated into those which are of primary importance, and those which are of secondary importance. If these be measured strictly by the degree to which they affect the numbers of bacteria in milk, the list of measures of primary importance becomes extremely small, while the list of measures of secondary importance becomes correspondingly large.

The score card can continue to have a vertical division separating its items into the familiar column of "Equipment" and "Methods," but it also can very well have a horizontal line of division, above which will be a list of equipment and methods of primary importance, and below which are those things of secondary importance. The things which are of primary importance affect most closely the decency of milk, while the matters of secondary importance refer more particularly to the decency of the dairy.

The essentials for clean milk production deal with only three things. These are:

(1) Milking.
(2) Cooling.
(3) Sterilizing.

If we assume that dairy cows and dairy employees are free from disease, sanitary milk of the highest type can be produced by a strict adherence to simple but standard methods for carrying out the three above mentioned operations.

If one were to give a numerical value to such measures, based on the degree to which they affect milk character, the three items in the above list should be credited with at least 90 out of 100 points. It seems, in fact, doubtful to me whether all of the other measures included in the score cards affect milk to an extent which justifies giving them a value of 10 points out of 100.

A good score card should give consistent scores on the same dairies in the hands of any competent dairy inspector. Abundant detail is vitally necessary to secure this result. A score card limiting itself to general headings leaves too much to the individual judgment of the inspector. The more detailed it is, the more accurate the score will be.

With these elements in mind I have undertaken from my personal view point to draw up a new type of dairy score card. I submit this knowing full well that there are likely to be found numerous inconsistencies in the same. I am aware that others are interested at the present time in improving score cards and in attempting to prepare cards of a new and more satisfactory type.

At best the score card must occupy a position which is only supplementary to the laboratory test for bacteria. Certainly the chief object of dairy scoring is to reduce the bacteria in milk. Where the laboratory shows the milk from a given dairy contains large numbers of bacteria the dairy inspector is certain to find some one of the "primary" factors in the above score card have been neglected.

The first prize for milk with the highest score at the New York State Agricultural Exhibition at Syracuse last fall was taken by milk from a dairy of the most ordinary type. This dairy could not hope for a high score on the old score card. But its strict adherence to the best sanitary methods of milking, cooling and sterilizing would give it a score above 90 points on the new card proposed. On such a card any dairyman, even with the commonest type of barn, can hope for a high score.

Finally, where the bacteria in the milk from a dairy are low, the dairy score will be correspondingly high, because the suggested card aims to lay the emphasis on those things which most affect the sanitary character of milk.

Received for publication, September 23, 1916.

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RESOLUTIONS ADOPTED AT THE FIFTH ANNUAL CONVENTION OF THE INTERNATIONAL ASSOCIATION OF DAIRY AND MILK INSPECTORS, OCTOBER 1, 1916.

1. Whereas, The United States government and the government of various states and cities have recognized our association by sending representatives to attend this convention; therefore be it

Resolved, That the International Association of Dairy and Milk Inspectors express its thanks to the U. S. Department of Agriculture, the U. S. Public Health Service, and to the various state and city authorities for their continued interest and active coöperation.

2. Whereas, This Association heartily favors the development of dairy inspection to the highest degree of efficiency; therefore be it

Resolved, That the International Association of Dairy and Milk Inspectors recommend that no dairy or milk inspector be employed by any state or city who derives any private income from the owners or employees of those dairies over which he exercises supervision.

3. Whereas, States and cities are apparently slow to recognize the need for well qualified and expert men for dairy and milk inspection; therefore be it

Resolved, That the International Association of Dairy and Milk Inspectors endorse the application of intelligent Civil Service regulations for the appointment of dairy and milk inspectors; and be it further

Resolved, That this Association urge that state and city departments be given authority to offer such salaries as may be necessary to secure thoroughly competent inspectors.

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THE INTEGRITY OF PUBLIC HEALTH WORK.

The integrity of the whole public health movement is conditioned on the integrity of the methods used in investigating and reporting on public health problems. Public health progress depends upon the discovery of public health truth. If fallacious conclusions are arrived at, useless administrative procedures will be initiated—and years of patient effort and vast sums of money will be wasted. And not only does the integrity of methods of investigation and reporting directly influence public health science and human welfare; it has an important indirect effect in that it influences the support accorded health measures. A public that has witnessed frequent reversals of health department policy naturally will form a low opinion of its health authorities and will refuse them the support readily granted departments concerned with more obvious realities—such as fire and crime. The problem is by no means limited to investigators or students; the health officer must, in his annual report, marshal statistics regarding the results obtained by his department, and in arriving at his conclusions he must run the gauntlet of statistical error and logical fallacy.

Realizing the importance of the problem, an informal committee of the sections on sociology and vital statistics of the American Public Health Association arranged for a symposium on the subject at the Cincinnati meeting. The resulting three papers, by Armstrong, Schneider and Dublin, which appear in this number of the Journal, show that a serious situation exists and give many useful suggestions for improvement. As one author remarks, many investigations are carried out on the principle of the shotgun rather than the rifle. The investigator fires away wildly in the hope that he may hit something. Too few persons realize that an investigation is made or marred at the very start; that a complete plan is indispensable to anything like efficiency; and that in a statistical investigation what may be reaped is determined almost completely by what is sown. Other matters over which investigators and reporting officials come to grief are indefiniteness in the use of terms; the editing, classifying and tabulation of data; and the interpretation and analysis of results. The frequency of logical fallacy—the confusion of association for causation—the indulgence in *post hoc* reasoning—is appalling. Then there is the matter of biased investigations: the enthusiast of this or that welfare movement sees everything in terms of his own subject and frequently is blind to unfavorable evidence while capable of reporting the most positive conclusions on favorable data of the slightest scientific value.

Let it be understood that we are here dealing with the efficiency of progress. As investigators and reporting officials vast potentialities lie in our hands. We must take care, not only that we may reach the truth ourselves, but for the example we set other workers in the field. We may by careful, skillful work secure an appreciable advance in our science and so materially curb the slaughter from preventable diseases that goes on in our country at the rate of several hundred thousand deaths a year; or we may by careless, fallacious activity waste the funds that are at our disposal, discredit our movement, spread misapprehension, and postpone the day when fewer persons shall die needlessly.

A GREAT SANITARIAN—DR. HERMANN M. BIGGS.

Governor Whitman of New York at the earnest request of the Rockefeller Foundation has granted leave of absence to Dr. Hermann M. Biggs, health commissioner of the state of New York, so that he may be able to proceed to France for the purpose of organizing a campaign to combat the spread of tuberculosis among non-combatants in that country. The situation existing has impressed itself as being extremely serious, and the Rockefeller Foundation has made no mistake in the selection of Dr. Biggs.

Mr. Jerome D. Greene, the secretary of the Foundation, in his letter to the governor states that the members of the Foundation "have had no difficulty in making up their minds that Dr. Hermann M. Biggs was the man whose character and attainments best fulfilled the requirements of the case. They realized that it would be asking a great deal of Dr. Biggs to make the sacrifice involved in a visit to France, and that the state of New York had the first claim on his services. They felt, however, that if it should be the happy result of Dr. Biggs' going to France that the benefits of his long and wonderfully fruitful service in New York could be availed of in the organization of the campaign in that country, the effect in terms of human welfare would be so large and far-reaching as to constitute a very strong claim both on his public spirit and upon the generosity of the state of New York."

American sanitarians will agree in that the Foundation's choice is indeed a most felicitous one, and extend to Dr. Biggs their best wishes on his important undertaking.

HOUSING CONDITIONS AS FACTORS IN THE PRODUCTION OF DISEASE.

JAMES FORD,
Department of Social Ethics, Harvard University.

IT IS generally conceded that housing conditions may affect the health of occupants. It seems obvious to most persons that improvement of housing conditions by legislation and other devices will reduce ill health. Nevertheless I cannot find anywhere in housing literature a sufficient use of the discoveries of the sciences of bacteriology and pathology, nor a list which is at all adequate, of the illnesses which may be occasioned, by the condition of man's habitation. The aim of this paper is to show the many ways in which the house deleteriously affects the health of its occupants.

The diseases associated with housing conditions may be classified according to origin as (1) traumatic (*e. g.*, maiming, bruising, burning, crushing); (2) parasitic (conveyed by animal parasites, *e. g.* malaria, hook-worm); (3) bacterial (conveyed by microscopic colorless plants); (4) chemical (inorganic poisonings); (5) nervous or mental. Of these the diseases of bacterial origin which are associated with housing seem to be numerically the most important, including as they do a large number of prevalent respiratory and intestinal diseases. The traumatic group is of notable importance, the parasitic and chemical of slight relative importance. The mental group is unmeasured and for the present unmeasurable, but perhaps the most significant of all.

The traumatic diseases, or injuries, caused by housing conditions, would include almost all forms of superficial wounds. Cases may be cited where men have been crushed by the falling of defectively built structures, or cut by broken window panes, or torn by projecting nails, or burned by tenement fires, or suffocated by the smoke of such fires. Such injuries are increasingly prevented through building laws, housing laws, and fire-prevention laws. Nevertheless, the number of cases of death and sickness so caused must still be considerable for America as a whole. Accidents, furthermore, such as falling on stairs, may be prevented by such simple devices as the prohibition of winders, the specification of height of risers and width of treads, and by the requirement that windows shall be provided to light halls, and that halls shall be artificially lighted at night. Accidents from defective balustrades or railings, rotten flooring, defective fire escapes, can be controlled by equally simple legal devices.

The diseases caused by chemical poisonings through the mediumship of the house are relatively unimportant, but they should include carbon monoxide poisoning, traceable to defective flues and illuminating gas poisoning from defective fixtures. These diseases may be prevented through specific legislation, and careful inspection.

The parasitic diseases are seldom closely associated with housing conditions. Nevertheless, in the case of two of the more prevalent diseases within this group, improvement of housing conditions will cause a notable reduction of morbidity. Malaria, which is transmitted from man to man, through the medium of the mosquito, may be reduced if rooms are well screened, though obviously prevention at the source is preferable. The hookworm disease, which ravages our South, is conveyed in regions where sanitary conveniences are primitive or non-existent, by an intestinal parasite, and may be prevented in large part by the universal requirement of sanitary privies, or of modern toilets.

There are a score or more of bacterial diseases associated more or less closely with housing conditions. The house furnishes in some way the the medium of transmission. Improvement of housing conditions in specific ways would tend to reduce each of the diseases in question. The first and most conspicuous group of bacterial diseases consists of diseases of the respiratory tract; tuberculosis, colds, influenza, bronchitis, and various other throat infections, may be included. Each one may be transmitted from individual to individual in all probability, by the inhalation of dirty air containing quantities of the specific bacteria in question. Since it is possible by housing legislation to control somewhat the factor of ventilation it is possible at least to hasten the desiccation of these bacteria, thus destroying their virulence. The maintenance provisions of housing laws, can in extreme instances cause the reduction in quantity of dust and dirt, in which such bacteria might live for brief periods outside of the human body. It is not altogether clear that these diseases may be dust-borne. It is clear, nevertheless, that a few bacteria may ride upon dust particles and may be inhaled, though perhaps not in sufficient quantity to cause serious infection. It is clear also that in the crowded tenement, droplets containing large numbers of virulent bacteria may remain for a while suspended in the air within a radius of several feet of the infected person, such bacteria being ejected by coughing, sneezing, or even loud talking. Control exercised over room crowding should therefore tend to reduce somewhat diseases of this nature, especially when supplemented by ventilation and maintenance provisions. Housing ordinances which provide for the natural lighting of halls and apartments, *e. g.* the paragraphs on sizes of yards, courts, windows, should have value also in the prevention or spread of the bacterial diseases, because exposure of the disease germs to the sun's rays causes them to lose their virulence within a very few hours, and strong diffused light, especially when supplemented by moving air, will destroy such germs within a few hours or days.

There are several diseases transmitted by intestinal bacteria, which are transmitted from man to man through contaminated food or drink. Several such diseases, typhoid fever, dysentery, cholera, in rural communities on the outskirts of our cities, beyond the municipal water and sewage systems, are transmitted from man to man by the privy and the contaminated well. These cannot be listed among the widely prevalent house diseases in cities enjoying universal municipal sanitation. Nevertheless, it is possible that such diseases are carried to some extent by flies from the privy or from any defective fixture, to the food of the adult, or in the case of infantile diarrhea, to the nipple of the milk bottle. The requirement in health and housing laws of the covering of garbage pails and manure piles, which are the breeding places of flies, and the removal of all organic wastes from all premises, would materially reduce the number of such carriers, and the adequate screening of homes would increase the protection.

Innocent infection from the venereal diseases is possible, according to many authorities, through the mediumship of the common toilet. The bacteria of these diseases may retain their virulence for from one to three hours, roughly, outside of the human body, provided they are in a moist place, and may convey the infection through an abrasion of the skin, even an abrasion so slight as to be invisible. The tendency of modern housing legislation to require a toilet for each family, is largely to be justified on these grounds. There are other ways in which housing may serve as medium of infection by these diseases for Dr. Antonio Stella of New York has cited instances of their transmission in crowded Italian homes, to young children, through contaminated bedding, towels, and the like. Various skin diseases, also trachoma and other eye diseases, may also be transmitted through the common towel. In the case of lodging houses, dormitories and hotels it is possible through legislation, to eliminate the common towel, and thus assist in reducing the transmission of this last group of infections.

The part played by vermin in the transmission of infections is little known as yet. Nevertheless, the bubonic plague is apparently transmitted by the rat flea, which would suggest that one essential means of prevention would be the rat-proofing of houses, possible through inexpensive structural devices which might be required in the building law. Experiments have shown also that disease germs of various sorts may be passed through the bodies of house insects, such as the cockroach or waterbug, without loss of virulence. Doctor Lord's experiments with the house fly have shown that the tubercle bacillus is also virulent after passing through the fly fed upon positive sputum from tubercular patients. The chances of infection of food from these sources seems worthy at least of consideration.

I have been able to find no specific study of the bearing of housing conditions upon the production of nervous disease. It seems probable, however, that the conditions of the home would materially effect the nervous tone of the occupant. This is very clear in extreme cases. The fright occasioned by a tenement house fire or conflagration, may result in considerable nervous instability in susceptible cases, and this instability may be lifelong and may handicap the ill person quite seriously in his or her life activity. It is to be expected also that premature and frequent sexual excitement and morbid sexual states may be induced, especially in children, by the crowded living of both sexes and all ages, and by the intimate association of families and lodgers. Furthermore it is virtually impossible for careful parents living in crowded quarters to protect their children from association with persons morbidly sexual or perverted. These are problems which are much more than housing problems, yet it is possible through public control of overcrowding and of the lodger evil, through specific preventions of prostitution in tenement houses, through requirements of separate toilets for each family, accessible through a private hall, to reduce these evils somewhat. Fatigue of nerve centres from incessant noises of crowded tenements, from sleeplessness caused by such noise, from eye-strain inevitable to dwelling in gloomy rooms, from excessive stair-climbing and the like may be classed with the nervous diseases and also, in the latter cases, with the traumatic diseases which are chargeable in part to housing conditions. All provisions tending to encourage the construction of cottage homes would tend to reduce these evils as well as the dangers from bacterial disease before mentioned.

Housing legislation is most effective in the prevention of disease in all probability, not because it provides means of reducing contact or destroying germs, but because of the part which it may play in the building up of resistance. Human beings vary apparently quite considerably in their relative constitutional immunity to specific diseases, but a given individual susceptibility to many diseases, as for example, tuberculosis, may be considerably affected by his mode of living. Resistance may be reduced by overwork, under-nourishment, abuse of alcohol or certain other poisons, apparently also by inadequate exercise. Resistance may apparently be increased by living in fresh air. It is probable also that sunshine plays a quite important part in increasing human resistance. The quality of the blood and that the number of phagocytes or white blood corpuscles which are among the most important of the body's defensive agents against disease, may be increased rapidly by exposure of the body to the sunshine. In so far as housing legislation tends therefore to increase the amount of fresh air and of sunshine in the homes of all classes, it presumably tends to increase resistance to disease. This, if true, offers the most cogent argument of all for housing legislation.

It should be undersood that housing conditions are seldom the sole cause of disease. There must be a constitutional predisposition, hereditary or acquired. In the case of infectious diseases, the germ must be present and ingested in infected quantities. Doctors disagree also as to the mode of infection or acquirement of many diseases. Nevertheless, the burden of proof lies with the person who criticises the general view of the pathologists and quarrels with the experience of health departments and investigators. Bad housing conditions of various sorts may be real factors in the reduction of health and in the production of a variety of diseases. Improvement of housing conditions will serve to reduce the volume of preventable diseases and accidents and may help to render the lives of persons of small income not only tolerable but efficient and joyous.

A MODEL LAW FOR REPORTING STILLBIRTHS.

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Read before the Vital Statistics Section, American Public Health Association, Rochester, N. Y., September 7, 1915.

IN ORDER to discuss the question of stillbirth registration we must first form a definite conception as to what constitutes a stillbirth, and what factors contribute to produce them and increase their frequency.

In 1913, the Statistical Division of the New York Milk Committee began the detailed tabulation of infant deaths in the various cities and states of the United States. The preliminary request for the statistical data called for a definition of the term stillbirth. The returns from this inquiry show a general lack of appreciation of the importance of stillbirth registration and a wide diversity of opinion as to what constitutes a stillbirth, as practically no two answers were the same.

The definition of Reginald Duffield, M. A. A. B. statistician, Royal Society of England, "A stillborn child means a child whose body at birth measures not less than thirteen inches (thirty-two centimeters) in length from the crown of the head to the sole of the heel, who, when completely born (the head, body, limbs of the child, but not necessarily the afterbirth, being extruded from the body of the mother) exhibits no sign of life; that is to say, whose heart has ceased to function as demonstrated by the absence of pulsation in the cord at its attachment to the body of the child and absence of any heart sounds or impulses." American Public Health Association: "For registration purposes stillbirth should include all children born who do not live any time whatsoever, no matter how brief, after birth." Doctor Beitler in his paper on the "Statistical Treatment of Stillbirths," read before this section at its last meeting, makes a plea for a broad definition of the term, suggesting the following: "Define the still-born child as including any product of human gestation which can be recognized as such, which, after birth (complete delivery of the entire child but not necessarily of the cord or afterbirth) does not breathe."

As we are to consider a law for stillbirth registration, a definition of the term stillbirth, which will contribute to the greatest extent to completeness and usefulness of registration, is the best definition. With this in view, I offer the following:

The term stillbirth applies to the birth of the product of human conception, at any period of uterogestation which, when entirely separated from the mother's body (head, body, and limbs, but not necessarily the placenta or membranes) shows no sign of life, sign of life being either cardiac pulsation, sounds or breathing.

The greatest public good derived from the registration of deaths is the accumulation of data relative to actual and contributing causes of death, thus furnishing definite information on which to base the prevention of disease and death. This being true, we must formulate a stillbirth registration law which will require the registration of all data regarding the frequency and cause of stillbirths.

The vital statistics of European cities furnish the best data on which to base a stillbirth registration law as exhaustive material has been gathered there for years.

FREQUENCY OF STILLBIRTHS.

The first function of registration is to determine the frequency of stillbirths. This is a question which has received a great deal of study in this country, but, as registration is incomplete in any American city, in most instances the rate has been based on a group of cases. Dublin, in his paper on Infant Mortality in Fall River, Mass., which is a review of 833 births occurring over a period of three months, finds a stillbirth rate of 46.5. Johnstown, Pa., reports a stillbirth rate of 56.7 for 1911. The New York City rate for 1913 was 46.7. Holt and Babbitt report a rate of 44 per 1,000 births at Sloan Hospital; the latter figure does not include abortions.

From a study of the last previous pregnancy of 784 multiparæ receiving prenatal care from the New York Milk Committee, I found one in every 15 pregnancies resulted in a stillbirth, a rate of 66 per 1,000. Bacon of Chicago estimates the stillbirth as 5 per cent. of all births, or a rate of 50 per 1,000. Comparing the rate as estimated in this country with those of European cities, we find them low. As for Paris, 1903 to 1909, there is a rate of 83.07 miscarriages and stillbirths, for 1,000 living and stillborn. Budapest rate for 1903 to 1905 was 130. The conditions of environment are undoubtedly different in these European cities but not of a sufficient degree to account for this marked difference in rates between them and our American cities.

SEX OF CHILD.

Relation of sex of child to frequency of stillbirths. According to Newsholme, the male stillbirths outnumber the female stillbirths, probably owing to the greater difficulty in childbirth. Thus in ten years, 1865 to 1875, they were in France 144, Italy 140, Belgium 135, Sweden 133, and Prussia 129, to every 100 female stillbirths. In Berlin, in 1895, the proportion of males to females among stillborn was 137 to 100; among the living 104 to 100. In Hamburg, in 1896, the proportion of males to females among stillborn was 125 to 100; among the liveborn 107 to 100. In New York City, in 1913, the proportion was 137.9 male stillbirths to 100 females; while the proportion in living births was 104.9 males to 100 females.

CHARACTER OF PREMISES OR WHERE STILLBIRTHS OCCUR.

The stillbirth rate will undoubtedly be high among those who live in poor environment, under crowded and unsanitary conditions, but, to have conclusive proof of this assumption, data as to the character of premises where stillbirths occur should be recorded.

DATE OF OCCURRENCE.

The date of occurrence of stillbirths is important, first, to identify stillbirths, and secondly, to determine the influence of seasonal changes on the frequency of stillbirths.

COLOR OR RACE.

The constitutional diseases which are actual and predisposing causes of stillbirths are more common to some races than others, this and the fact that more should be known regarding the influence of race or color on the frequency of stillbirths should warrant the recording of color or race, where it can be determined.

NAME AND RESIDENCE OF PARENTS.

The name and residence of father should be recorded for purpose of identification of stillbirth. The registration of the maiden name of mother is the only guide used in this country to determine the legitimacy of the child. The question of legitimacy seems to have a great deal of bearing on the frequency of stillbirths, as the rate per 100 children born alive in Paris, 1903–1909, was for legitimate miscarriages (before the 28th week), 5.63, illegitimate, 7.03, for stillbirths of viable age, legitimate, 2.99, illegitimate, 3.29.

Newsholme states that the proportion of stillborn is greater among the male illegitimate than among the male legitimate children. This is shown by the following figures. Of every 1,000 births including stillborn, the number of stillborn or reported as such was as follows, among:

Country.	Period of observation.	Leg.	Illeg.
France	Countries in which inquiry as to paternity is forbidden. Period 1878–1882.	42	78
Belgium		43	58
Prussia		39	54
Austria	Countries in which inquiry as to paternity is allowed. Period 1878–1882.	24	38
Hungary		14	30
Sweden		28	37
Norway		32	50

BIRTH-PLACE OF MOTHER AND FATHER.

The birth-place of the mother and father should be recorded to determine the difference in the frequency of stillbirths among native and foreign-born and the influence of mixed marriages in the frequency of stillbirths.

AGE OF PARENTS.

The age of the mother seems to have great influence on ability to give birth to living children. The factors which contribute to the increased frequency of stillbirths with the increase of age of mother are loss of elasticity of tissue, increase in length of parturition and increase in number of abnormally large babies. Thus for Paris, Budapest and Middlesbrough, 1903–1909, Doctor Gini of Italy presented the following figures at the first International Eugenics Congress in 1912, miscarriages and stillbirths per 100 children born alive:

Age of mother.	Paris.	Budapest.	Middlesbrough.
Up to 20......	7.5	8.88	6.3
20 to 24......	7.69	11.76	6.8
25 to 29......	8.62	14.32	6.9
30 to 34......	10.97	....	8.4
35 to 39......	11.59	17.05	9.3
40 to 44......	12.99	....	10.3
45 and over....	18.41	21.73	7.2 (number small)

Age of Father.

Doctor Gini also presents the following table to show the increase in the number of stillbirths, with the increase of age of father, considering also the length of married life. Legitimate stillbirths and miscarriages per 100 legitimate born alive, according to age of father, city of Paris, years 1895 to 1909:

Age of father.	Years married.			
	1 yr. or less.	3 yrs.	5 to 9 yrs.	Any length.
Under 20 20 to 24	8.28	3.88	8.97	6.66
25 to 29	9.45	7.28	8.69	7.95
30 to 34	9.11	6.78	10.13	8.36
35 to 39	10.06	7.62	10.05	9.56
40 to 44	11.28	7.94	9.81	11.13
45 to 49	14.19	10.70	12.42	12.23
50 to 59	14.33	11.18	12.44	11.93
60 and over		......	16.81	13.57

Color or Race of Parents.

As in the case of the color or race of the stillbirth the color or race of the parents should be recorded as certain constitutional diseases, such as syphilis and tuberculosis, which are actual or predisposing causes of stillbirths are more common to some races than to others. The amount of influence of intermarriage of races on the frequency of stillbirths could also be determined.

Occupation of Parents.

The recording of the occupation of the father and mother is important. The registration of the occupation of the mother is most important, as this will give accurate information as to the influence of occupation common to our laboring class of mothers, such as treddle work, on the termination of pregnancy.

Period of Utero-gestation.

In defining the term stillbirth I have included all products of human gestation. Many registrars object to the registration of stillbirths occurring before the 28th week (abortions). There is a tremendous loss of potential life before this period as shown by the following data taken from standard text-books on obstetrics: King states in his Manual on Obstetrics that one-sixth of all pregnancies result in an abortion, stillbirth before the 28th week; Playfair, one to every eight to ten; Williams, one to five; Malines, in 2,000 pregnancies, found a stillbirth percentage of 19.23. If we are to prevent this tremendous loss of prospective child life, we must register all abortions and state definitely the period of gestation born.

Number of Previous Pregnancies.

The number of previous pregnancies should be recorded to establish the order of birth. This is essential as shown by Doctor Gini in Saxe-Meiningen and Luxemburg, and Westengaard in Berlin. Index number of birth mortality according to the order of birth, eliminating the influence of the age of the mother. The birth mortality in the various categories of births work out at:

Order of birth.	In Saxe-Meiningen, 1878–1889, taking the birth mortality as 100 among the first born.	Luxemburg, 1901–1903, calculated as Saxe-Meiningen.	Berlin, 1893–1897, taking birth mortality of all births as 100.
1st birth....	100	100	112
2d birth....	57	70	90
3d birth....	51	62	82
4th birth....	47		90
5th birth....	46		
6th birth....	44	59	94
7th birth....	34		
8th and 9th .	42		107
10th and upwards......	50	72	126

NUMBER OF LIVING BIRTHS.

The number of living births should be recorded in order to determine the number of successful deliveries and, by elimination, the number of stillbirths in individual cases.

ACTUAL AND PREDISPOSING CAUSES OF STILLBIRTHS.

Statements as to the most apparent or actual cause of death of child, also the contributing or predisposing causes is necessary to furnish data on which to base the prevention of stillbirths.

TIME OF DEATH OF CHILD.

Data as to whether the child died before or during labor is of vital importance in determining the proficiency of those engaged in the practice of midwifery and for a study of intrapartum mortality.

CONDITION OF THE CHILD'S BODY.

Recorded as to whether the child's body is macerated or mutilated to determine more directly the time of death and factors contributing to death where body is mutilated.

RECAPITULATION.

Thus, we have gone over all the factors which contribute to the production or increase of the frequency of stillbirths, with a brief discussion why data as to each item should be reccorded on the stillbirth record.

To recapitulate we have,
Sex of child,
Character of premises where stillbirth occurred,
Races or color of stillbirth,
Legitimacy, name of father, maiden name of mother,
Birth-place of father and mother,
Age of parents,
Race and color of parents,
Occupation of parents,
Period utero-gestation,
Number of previous pregnancies,
Number of living births,
Actual and predisposing causes of death,
Time of death,
Condition of child's body.

REGISTRATION.

There are certain states and cities that report stillbirths, as both births and deaths. When we stop to consider that one of the most important functions of vital statistics is to furnish a source of study for the prevention of disease and death, can we possibly get the desired information to aid us in the prevention of stillbirths if we so register them? Again, consider whether this stillbirth effects the economic or social conditions in the same manner, as a child who is born alive and dies.

If not, we must put the stillbirth in a separate class.

THE PROPOSED LAW.

I take the liberty of offering for your consideration the following stillbirth registration law which is formulated by one who is not a statistician, but is interested in the conservation of human life, especially the life of the child whether born or unborn.

A LAW GOVERNING THE REGISTRATION OF STILLBIRTHS.

The term "stillbirth" shall apply to the birth of the product of human conception, at any period of utero-gestation, which when entirely separated from the mother's body (head, body, and limbs, but not of necessity the placenta or membranes) shows no sign of life. Signs of life are cardiac pulsation, sounds or breathing.

It shall be the duty of the parents of any stillbirth born in the city or state of ——, and of every person present at such stillbirth, to file with the Department of Health, within thirty-six hours after such stillbirth, a report in writing stating as far as is known the date, the street number, character of premises of said place of stillbirth, the sex, race or color, the time of death of stillbirth (before or during labor), period of utero-gestation, the actual and predisposing causes of said stillbirth, the condition of stillbirth remains whether macerated or mutilated, the name of father, maiden name of mother, the residence, birth-place, age, color or race, and occupation of father and mother, number of previous pregnancies of mother and number of living births.

It shall be the duty of physicians and midwives to keep a registry of the several stillbirths in which they have assisted professionally, which shall contain the date, the street and number, character of premises of said place of stillbirth (before or during labor), the period of utero-gestation, the actual and predisposing causes of said stillbirth, the condition of stillbirth remains, whether macerated or mutilated, the name of father, maiden name of mother, the residence, birth-place, age, color or race and occupation of father and mother, number of previous pregnancies of mother and number of living births.

It shall be the duty of such physicians and midwives also to file a written copy of the said registry of stillbirth with the Department of Health, within thirty-six hours after such stillbirth, upon the blank forms furnished by the said Department.

It shall be the duty of said physicians and midwives to certify that they attended personally at the birth of the stillbirths so reported, and that all of the other facts stated in the copy of the said registry are true to the best of their knowledge, information and belief.

The penalty for violation of this law shall be the same as for violation of death registration law.

DISPOSAL OF THE REMAINS OF STILLBIRTHS.

Although the disposal of the remains of stillbirths is not within the scope of this paper, I would like to mention this subject in closing as I am convinced that it has some bearing on the completeness of registration.

The expense of proper disposal of the remains of stillbirths is a hardship which comes at a time when the family purse has already been greatly taxed, and this may also be partly responsible for the neglect of parents and doctor to register the stillbirth. The doctor is often called upon to dispose of the remains. By doing so he is violating the law, but he sees the financial condition of the family and takes the responsibility. But does he in such cases register the stillbirth? I believe not. To correct this unsatisfactory condition the departments of health of cities could provide means for disposal of bodies of stillborn infants, when properly registered and the consent of the parents obtained. This would mean the saving of thousands of dollars to poor people in a city like New York, and encourage a better spirit of coöperation among physicians with the health authorities in establishing registration, and at the same time promote prompt and complete returns and the proper disposal of the dead.

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IMPROVED TECHNIC IN BACTERIAL AIR ANALYSIS.

William W. Browne,
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Read before the Laboratory Section of the American Public Health Association, Rochester, N. Y., September 10, 1915.

The Committee on Standard Methods for the Examination of Air in its 1910 Report recommended the use of the sand filter. The method in brief consists in filtering a known volume of air (10 liters at least) through a sand filter one centimeter deep. The sand shall have passed through a 100 mesh sieve and be held in filtering tube (10 x 1.5 cm.) by bolting cloth and cork. After filtration the sand is shaken into 10 cc. of sterile water, thoroughly agitated, plated and incubated 5 days at room temperature. The procedure as recommended by the Committee is open to at least four possible sources of error and errors are important in air analysis because of the small number of microörganisms present in air.

1. Bacteria may be carried down by the sand as it quickly settles.

2. Loss of sand and microörganisms as the sand is dumped from or sticks to the filter.

3. Difficult to have exactly 10 cc. of sterile water in the tube after sterilization and storage.

4. Contamination from or loss on the cotton plug when water is thoroughly shaken.

The first error can only be eliminated by the substitution of a soluble for the insoluble filter. The technic described in this paper at least reduces the possible error in the other three cases.

The filter tube as seen from the illustration consists of the old filter tube and diluting tube fused together at right angles to each other. The filter is filled and sterilized in the usual manner. During filtration the tube is held in the position as indicated in

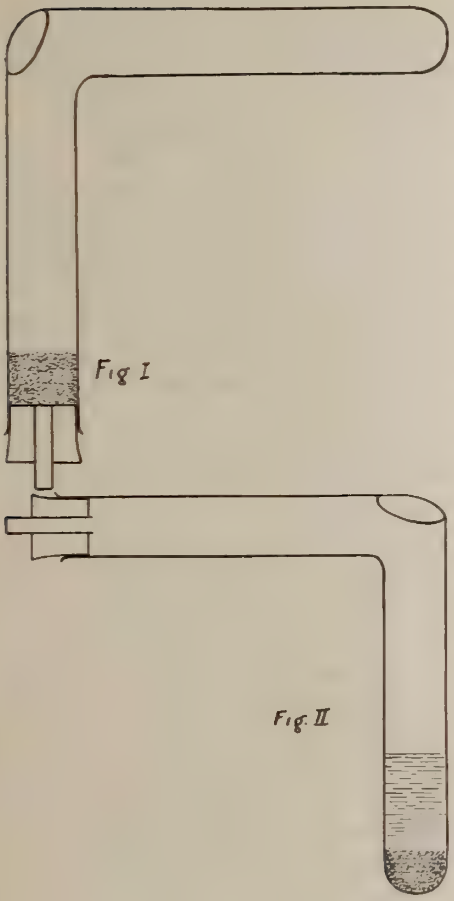

Figure I as the air is pumped through. After filtration the tube is turned to the position as indicated in Figure II. The sand is easily poured from the filter tube in the diluting tube and a few gentle taps will serve to loosen the remainder. The filter plug with the bolting cloth is replaced by a sterile stopper after which exactly 10 cc. of sterile water are added by means of a sterile pipette into the diluting tube. The sand is thoroughly shaken and the water rocked back and forth from the filter tube to the diluting tube after which it is pipetted into plates in the usual manner.

The advantages of this technic may be summarized as follows:

1. One tube composed of the old filter and diluting tube instead of two separate tubes.
2. Gravity organisms are eliminated by overhanging lip.
3. Less glassware to be sterilized.
4. Exactly 10 cc. of sterile water is used in dilution.
5. The error in pouring the sand from the filter to the diluting tube is eliminated.

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THE MENACE OF SMALLPOX.

Reports from the U. S. Public Health Service and from the Connecticut State Board of Health show a disquieting prevalence of smallpox in various parts of the country. The Connecticut cases, mostly in the vicinity of Waterbury, Torrington and Naugatuck, are especially to be feared, because of the intimate railroad connections between these communities and New York City. The last considerable outbreak of smallpox in this city occurred in 1902, when 1,461 cases were reported. In large cities where there is no lack of frequent importation of the virus, where, in fact, the poison is perennial, an epidemic will come about whenever there is a sufficiently large number of persons capable of infection, that is to say, unvaccinated. This accounts for the well-established periodicity of smallpox epidemics. Experience has shown that in New York an epidemic of smallpox may be expected about every ten or twelve years. —*Bulletin of the New York City Health Department.*

FINAL REPORT OF THE COMMITTEE ON STANDARD METHODS FOR THE EXAMINATION OF AIR.

Presented before the Laboratory Section, American Public Health Association, Cincinnati, Ohio, October 27, 1916.

THE Committee on Standard Methods for the Examination of Air was first appointed in 1907 with the following membership: Mrs. Ellen H. Richards, Dr. G. A. Soper, Mr. J. Bosley Thomas, Prof. John Weinzirl and Prof. C.-E. A. Winslow, chairman. It made its first report at the Richmond meeting of the Association in 1909, recommending certain standard procedures for the determination of temperature, humidity, light, carbon dioxid and bacteria (published in the *American Journal of Public Hygiene*, XX, May, 1910, 346). At that time, very little work had been done from a practical sanitary standpoint on the physical and bacteriological aspects of our work, and the report was necessarily of a somewhat tentative nature. The committee was continued with the following membership: Dr. T. R. Crowder, Prof. M. J. Rosenau, Dr. G. A. Soper, Mr. J. Bosley Thomas, Prof. John Weinzirl, and Prof. C.-E. A. Winslow, chairman; and a second progress report was made at the Washington meeting in 1912 (AMERICAN JOURNAL OF PUBLIC HEALTH, III, January, 1913, 78).

In view of the fact that the bacteriological problems of air examination had been quite satisfactorily solved while important questions in regard to chemical analysis remained unsettled, the committee was reconstituted with a stronger representation on the chemical side, Prof. W. P. Mason, Prof. G. C. Whipple and Prof. E. B. Phelps being appointed to serve with Dr. Crowder and the chairman of the old committee. Dr. C.-T. Graham-Rogers has also rendered very valuable service as an advisory member.

The committee promised itself, and promised the section, that its labors should this time be complete. Each year, however, new and often revolutionary methods are coming up for the study of air conditions. While we can report quite definitely on certain standard procedures, there are other methods which we can only suggest as worthy of investigation without definitely endorsing them from exhaustive studies of our own,—yet which we feel are too promising to pass unnoticed. Such a condition must always exist in a growing science; and we feel that after nine years of work it behooves the committee to present its view of the present state of the art and ask that the methods suggested be printed and approved as provisional standards, subject to future revision whenever changes are called for by new knowledge.

DETERMINATIONS TO BE MADE IN THE EXAMINATION OF AIR.

The subjects considered in the two progress reports of the committee have been temperature, humidity, velocity of air currents, dust, illumination, determinations of carbon dioxid and poisonous gases, and the enumeration of bacteria. In regard to all these points except illumination, extensive studies have been made by members of the commission or under their immediate direction. The measurement of rate of heat loss from a warm moist surface, which is perhaps the most satisfactory measure of bodily comfort, has also been investigated in detail. Definite standard methods are suggested below for all these determinations.

It has not been possible for the committee to study the methods in use for the measurement of illumination, which, although briefly mentioned in the progress reports, do not really fall within the scope of its activities. Without making any definite recommendations, on this point the committee may refer those who are interested in the hygiene of lighting to important recent reports by the English Departmental Committee on Lighting in Factories and Workshops (Great Britain, 1915) and by Schereschewsky and Tuck (1915) of the United States Public Health Service.

DETERMINATION OF TEMPERATURE.

In view of the fact that overheating has been clearly shown to be the primary cause of discomfort and injury to health in badly ventilated rooms, careful observations of temperature are of the greatest importance in studies of air conditions. With the exception of the determination of rate of heat loss from a warm moist surface, to be discussed later, temperature records are more significant from a hygienic standpoint than any other class of observations.

Chemical thermometers without backings (which involve a serious lag) and maximum and minimum thermometers are useful for special studies, but in order to gain a really satisfactory idea of temperature conditions a continuously recording instrument should be used and records obtained covering a period of several days. A number of good instruments are now on the market. Continuous records of temperature of this type are recommended as the standard procedure wherever possible. The adjustment of the instruments should be checked daily or oftener by comparison with a standard sling psychrometer.

If the necessity for examining a large number of rooms makes it impossible to install recording thermometers in all cases an accurate mercury thermometer (without backing) may of course be used for occasional observations. In studying air conditions in a large school or factory the installation of recording thermometers in certain rooms with occasional observations in other rooms will prove a helpful combination.

The standardization at regular intervals of thermometers and other similar instruments of precision is essential to accurate results. Every laboratory and sanitary worker should have a few instruments which have a Bureau of Standards or similar certificate of accuracy and can be depended upon as accurate enough to be used for comparison.

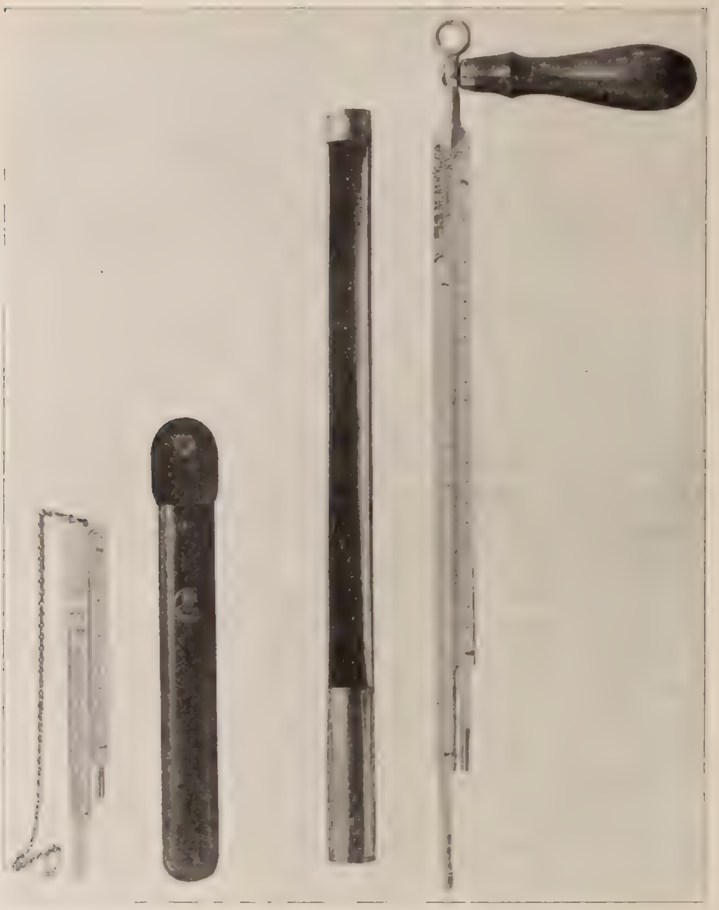

Fig. 1. Two Types of Sling Psychrometer.

Determination of Humidity.

Determinations of the humidity of the air are particularly important in certain factories and workshops in which high humidity is combined with high temperature. Variations in humidity at ordinary temperatures and, particularly, variations in the direction of dryness, are less significant than was once believed.

The standard apparatus for measuring humidity is the United States Weather Bureau Sling Psychrometer, which may be obtained in slightly modified forms from all dealers in physical instruments. The use of the instrument is fully described in Bulletin No. 235 of the United States Weather Bureau, which also contains the tables necessary for calculating relative humidity, moisture content and dew point from the readings of the wet and dry bulb thermometers (Marvin, 1912).

There are also upon the market good recording psychrometers in which stationary wet and dry bulbs are played upon by a small fan, the movement of the mercury or inert gas contained in the bulbs, being communicated through a tube to a recording apparatus, the record being traced on a paper scale as in the recording thermometer. These are valuable for special studies but the variations in humidity are neither so rapid nor so important as to call for their use in ordinary studies.

The stationary hydgrodeik is, of course, quite unreliable unless provided with special air circulation from an electric fan. Even the sling psychrometer, although satisfactory enough for ordinary sanitary purposes, is not an instrument of great precision, especially outside the ordinary ranges of room temperature. Rideal and Hannah (1915) have described a chemical hygrometer in which the moisture in the air is determined by the reduction in volume after absorption by sulphuric acid; and this instrument may prove of value when very great accuracy is desired.

Dr. E. C. Howe (1916) has recently described an ingenious instrument for determining relative humidity in churches, libraries, street cars, or sleeping car berths, where the conspicuousness of the sling psychrometer or the space required to operate it, might interfere with its use. Dr. Howe's apparatus consists of a small wet and dry bulb pair, with a toy motor and small fan attachment to produce the necessary air circulation.

MEASUREMENT OF HEAT LOSS FROM A WARM MOIST SURFACE.

The temperature of the air is only one factor in determining the effect of atmospheric conditions upon the temperature of the body. Heat loss from the body surface depends upon air humidity and particularly upon air movement, as well as upon air temperature. The ordinary mercury thermometer is, therefore, a very inadequate measure of the actual physiological effect of atmospheric conditions. The condition in a close room has been commonly compared with that which obtains outdoors on a muggy day in summer; yet it is a matter of experience that the outdoor temperature must be very much higher than the indoor temperature in order to produce a comparable degree of discomfort.

Dr. W. Heberden (1826) pointed out these facts nearly a hundred years ago and suggested a way out of the difficulty by the observation of the rate of fall of a thermometer previously heated to a high temperature. He heated a thermometer to 100° F. and noted the number of degrees which it fell in ten minutes as a measure of "sensible cold." He records drops of from 8° to 22° in the first ten minutes.

The same principle has recently been independently applied by Dr. Leonard Hill in England (Hill, 1913; Griffith, 1915), in the instrument which he has called the Kata thermometer.*

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*Sold in United States by H. N. Elmer, 1140 Monadnock Building, Chicago (agent for Siebe Gorman Company).

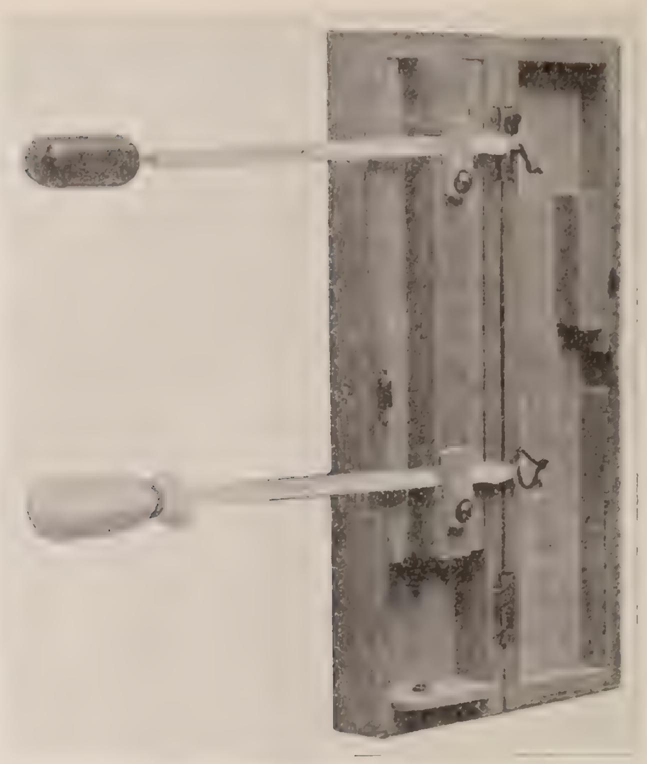

FIG. 2. The Kata Thermometer.

The Kata thermometer outfit as first proposed by Hill consisted of two specially constructed thermometers with large bulbs and stems graduated from 86° to 110° F., one to be used as a dry and the other as a wet bulb thermometer. The bulbs are heated to about 110° and then placed in clips which hold them in a horizontal position, after drying the bare bulb on a clean cloth and jerking excess moisture off the silk covered one. The time taken to fall from 100° to 90° is then noted, best by the use of a stop-watch.

The rate of fall of both thermometers will obviously be affected by air movement and radiant heat as well as by air temperature, and that of the wet bulb by the humidity of the air as well. Doctor Hill believes that the combined influence of these factors will affect the Kata thermometers very much as it does the human body, and suggests a 45–60 second period for the wet bulb and a 150–180 second period for the dry bulb as limits for comfortable atmospheric conditions. Recent studies by one of us (Winslow, 1916) have indicated that the lower of the limits set corresponds very closely to the average vote of a number of observers as to bodily comfort.

Hill, Griffith and Flack (1916) have recently presented a detailed study of the physical problems involved, in which the heat loss from the Kata thermometer is calculated in a more exact manner in millicalories per square centimeter per second, and the Siebe Gorman Company are now putting out instruments whose factors as compared with a laboratory standard have been determined. These new bulbs are graduated only from 95° to 100°. The factor divided by the number of seconds it takes to make this five-degree drop gives the rate of cooling at body temperature in millicalories per square centimeter per second. The wet Kata thermometer gives the rate of cooling by radiation, convection and evaporation. The dry Kata thermometer gives the rate of cooling by radiation and convection. The difference between the two is the rate of heat loss due solely to evaporation.

This instrument is a distinct improvement over the earlier patterns in that results from different instruments are now directly comparable.

Prof. E. B. Phelps of the United States Public Health Service has devised an instrument based on the same principle, which has the great advantage of permitting of continuous records of heat loss. It consists of a wet bulb thermometer heated by an electrical coil and constant current of such a strength that in a saturated atmosphere the thermometer registers 8° higher than an unheated bulb.

Professor Phelps' instrument, which he has named the Comfortimeter, has so recently been perfected that it has not been possible for other members of the committee to study it.

The only difficulties which are likely to be encountered in the use of this apparatus pertain to the heating element, and once the constancy of the heat supplied to the bulbs can be assured this instrument is bound to be of great promise.

We are of the opinion that either the Kata thermometer or the Comfortimeter or some other instrument which will give similar information as to actual heat loss should be used in all studies of atmospheric conditions from a hygienic standpoint.

MEASUREMENT OF AIR FLOW.

The quantitative measurement of air flow in ducts may be most accurately made by means of the Pitot-tube. This instrument and its method of use are described in the Report of a Committee on Standardization of the Use of the Pitot-tube, in the Transactions of the American Society of Heating and Ventilating Engineers (Vol. XX, 1914, pp. 210–215).

For measuring air flow at register openings and other places where the velocity is high the vane wheel anemometer is generally used. Since this instrument works against the friction of moving parts its readings are subject to serious variations. Anemometers should therefore be frequently calibrated and even so at very high or very low velocities they will not generally yield results of high accuracy. Great care must be taken in using the anemometer that sufficient readings are made at different points over the cross section of flow to eliminate the effect of eddies and other local variations in velocity. The anemometer should never be moved about in the plane of observation while taking readings, as part of the momentum of the movement is translated into revolution of the vanes. The following procedure should be followed as recommended in a report of the Committee on the Best Way to Take Anemometer Readings (Transactions of the American Society of Heating and Ventilating Engineers, Vol. XIX, 1913), p. 202.

1. The opening shall be divided into equal rectangular areas, no side of which shall be over 10 inches long, excepting where this would require more than ten readings, in which case the opening shall be divided into twelve equal areas.

2. Readings are to be taken in every case at the center of every area.

3. Readings are to be of one-half minute duration, the anemometer being held at the register base or in the plane of the opening.

4. Where the diffusers are used, a total area is to be computed on the basis of the periphery of the diffuser.

5. The average of the readings is to be considered as the average velocity at the opening. Where negative velocities are found, they are to be deducted in arriving at the average velocity.

6. In computing volume, the net area of opening is to be taken, the volume to be considered as the product of the average velocity and the net area of the opening.

7. If the anemometer is held two inches from the register face, no deduction shall be made for the area occupied by the register mesh.

Currents of air of too slight velocity to be measured by the anemometer may be studied by various methods which must be adapted to local needs and cannot well be standardized. Smoke from joss sticks is recommended by many observers. The New York State Commission on Ventilation has used bits of tissue paper attached to light threads suspended from a horizontal arm, the velocity of the current being estimated from the angle of deflection of the strip. The Chicago Commission on Ventilation has made a special study of this subject and describes four different devices as follows (Chicago, 1915):

(1) A cloud of ammonium chloride fumes produced by contact of ammonium hydroxid and hydrochloric acid.

(2) Fumes of strong ammonia, their arrival at different parts of the room being detected by pledglets of absorbent cotton suspended in Soxhlet extraction shells and saturated with phenolphthalein.

(3) Small toy ballons inflated with hydrogen and counterpoised with small weights.

(4) Light pin wheels of aluminum foil fastened into a cork hub balanced

on a fine cambric needle supported on a cork base.

DUST.

The study of the dust content of air is of very great sanitary moment in connection with certain industrial processes in which irritant or poisonous dusts are discharged into the atmosphere in considerable amounts. In the 1909 report of the committee two methods were suggested for the determination of dust,—Aitken's koniscope for the study of ordinary air, and the sugar filter for air heavily laden with dust particles.

In the 1912 report it was pointed out that the koniscope, and similar instruments which depend on the formation in a vacuum of droplets of moisture upon the material particles suspended in the air, are not wholly satisfactory for practical sanitary use because they are adapted for the study of dust of a different order of magnitude from that which is significant from a sanitary standpoint. The koniscope reveals all the minute ultra-microscopic particles in the atmosphere and thus masks the differences in the number of fairly large particles (such as industrial dusts) in which the sanitarian is interested. For example, in a recent study of the air of New York streets and schools by the filtration method, it was found that the number of dust particles generally varied between 400,000 and 1,000,000 per cubic foot. These particles, which are for the most part of such a size as to cover a field of about .0001 sq. mm., are the ones which vary markedly in clear air and in obviously dusty air; and it is these which we want to study. Macfadyen and Lunt (*Transactions of the British Institute of Preventive Medicine*, I, 142), on the other hand, found about 9,000-000,000 dust particles per cubic foot even in ordinary indoor air by the use of the dust counter, which works on the same general principle as the koniscope but is a more exact instrument. The dust counter determines exactly, and the koniscope determines approximately the number of particles down to a very high degree of fineness of the particles. What is needed for sanitary purposes is a reasonably accurate determination of the comparatively few, but rather large, particles which lacerate the epithelial tissues and favor the development of disease.

In the 1912 report, therefore, we recommended a modified filtration method and mentioned as a possible alternative the procedure suggested by Graham-Rogers, which consisted in separating out the dust particles by directing a current of the air to be studied against a glycerinated plate.

During the past two years the whole problem of dust determination has been somewhat exhaustively studied under the general direction of members of the committee, and the results have been presented by Palmer, Coleman and Ward (1916).

The study of dust particles in the air involves two distinct steps, concentration and measurement,—except in the case of the koniscope and dust counter which eliminate concentration by determining the number of particles directly. These optical methods we are convinced are fundamentally unsuited for sanitary use because they fail to discriminate between particles of different sizes.

A number of the most promising precipitation methods were studied by Palmer, Coleman and Ward with unsatisfactory results. A centrifugal device suggested by Mr. Wells of the United States Hygienic Laboratory proved cumbersome and difficult of operation. Precipitation by the use of a high tension pole has been studied by Doctor Macmillan of the New York City Health Department but does not yet appear to have been worked out in a practical way for the determination of small quantities of dust. The Graham-Rogers plate seemed the most promising of the precipitation methods, and was carefully studied. It permits only of counting and not of weighing the particles however; and we are of the opinion that for sanitary use both weighing and counting should be possible, as the total amount of dust and the number of particles are both important factors. Furthermore Palmer, Coleman and Ward found that this method only gives about one per cent. of the number of dust particles determinable by other procedures. We are inclined to believe that it is impossible to take out any large proportion of the dust particles present in the air by any rapid precipitation method.

On the other hand the investigation in question revealed fundamental and unsuspected errors in the sugar filter method, which had previously been considered the most satisfactory one available. Filtration methods, like those in which the dust is separated by precipitation, do not permit of collecting in any brief period a sufficient sample to permit of weighing as well as counting under the microscope. If filters are run for a number of hours weighable samples may be obtained, but this is not practicable in routine studies, of schools and factories for example. Furthermore the studies of Palmer, Coleman and Ward indicated that with air containing little dust there were serious errors introduced in the microscopic count by dust in the sugar or distilled water or on the counting slide or cover slip which it was almost impossible to exclude even with the greatest care in manipulation.

An entirely new procedure was devised by Mr. G. T. Palmer of the New York State Commission on Ventilation (Palmer 1916) which seems to be free from these objections and to furnish the most satisfactory solution yet suggested for all the difficulties involved. This apparatus combines the forces of precipitation and filtration somewhat on the principle of a commercial air washer. The air to be sampled is drawn through water in a shallow trap at such a rate as to break the water up into a fine shower of spray in a glass bulb above, and this spray takes out the dust in the air and finally washes it down into the trap. After the completion of a run the dust collected in the water may be estimated by any or all of three methods,—by direct microscopic enumeration in a Sedgwick-Rafter cell, by weighing after filtration through a Gooch crucible, or by comparing the turbidity of the organized suspension with a set of standards. This apparatus retains the 99 per cent. of dust particles which pass the Graham-Rogers plate. It is free from the errors due to dust particles in media or on glassware which invalidate the sugar filter when the amount of dust is small because 100 cubic feet of air can be passed in half an hour (against seven hours for the sugar filter), giving counts high enough to make such errors negligible. Above all the fact that such large volumes of air can be sampled makes it easy to weigh as well as to count the dust particles present.

This method is a new one and may no doubt be altered and improved in the future. In its present form however it has given entirely satisfactory results as tested in the laboratories of three members of the committee (W. P. M., E. B. P., C.-E. A. W.). We believe it to be the most promising method now available and recommend that it be used in ordinary sanitary investigations.

The Palmer Water Spray Apparatus was described and figured in the American Journal of Public Health for January, 1916 (Vol. VI, page 54) and may be obtained from Wallace & Tiernan of 136 Liberty Street, New York. The apparatus including the motor and the venturi meter for measuring the air may conveniently be mounted in a light dress suit case, the whole weighing 17 pounds or less. The technique as worked out by Palmer, Coleman and Ward is as follows: In air not visibly very dusty 200 to 400 cubic feet of air should be passed through the washer, while in more dusty air 100 to 200 cubic feet will suffice. About 40 cc. of distilled water is placed in the trap and about

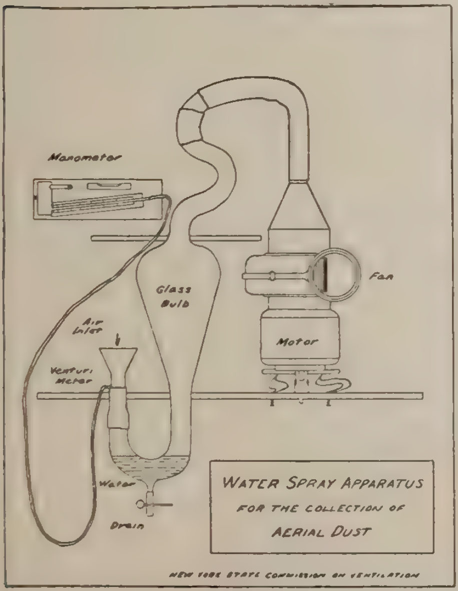

FIG. 3.

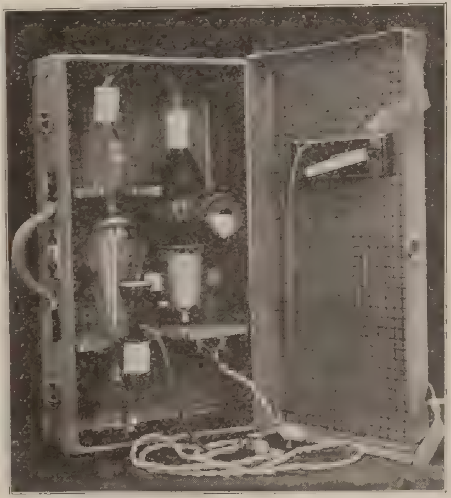

FIG. 4. WateSamr Spray pler. Showing air pump and glass sampling bulb, air measuring tube over inlet and indicating manometer.

once in five or ten minutes (depending on the temperature and humidity of the atmosphere) water is added to make up the loss from evaporation. After the run is completed the water with its suspended dust is drained into a bottle, the bulb is rinsed several times with distilled water, and the original water plus the washings are made up to 100 cc. One cc. of this suspension after thorough shaking is transferred to a Sedgwick-Rafter cell and five fields, at the center and four corners, counted under a $\frac{2}{3}$ inch objective. Where both light and heavy dusts are present this procedure must be repeated for the top and the bottom of the cell. A second cc. is then placed in the cell and counted in the same way. The dust particles may conveniently be grouped in five classes, according to size, as follows:

1. Large masses, about 100 standard units (.04 sq. mm.).
2. About 25 standard units (.01 sq. mm.).
3. About 1 standard unit (.0004 sq. mm.).
4. About $\frac{1}{4}$ standard unit (.0001 sq. mm.).
5. Dust too fine to count,—presence indicated by a plus sign.

A control count should always be made using the same slide and the same batch of distilled water; and the average of the five field counts obtained subtracted from the average of the ten field counts of the suspension of dust.

The remainder of the suspension should be filtered through a weighed Gooch crucible, the crucible and contents dried for one hour at approximately 100° C. and weighed to .1 mg.

The sugar filter may still be of value in the study of very dusty air and in places where electric current is not available it may be operated by the use of a hand-pump or an aspirator. The sugar filter method was described in our 1912 report as follows: "The committee in its recent studies has used a chemical adapter (a conical piece of glassware seven inches long having openings of $\frac{5}{8}$ inches at the smaller end and $1\frac{1}{2}$ inches at the larger end). The small end is closed with a perforated rubber stopper over which is placed a piece of bolting cloth to support the filtering layer made up of about 2.5 grams of granulated sugar, forming a layer 1 cm. deep. Five cubic feet of air can be drawn through this filter in eighteen minutes. The sugar is dissolved and the contained dust suspended in 10 cc. of distilled water and 1 cc. of the suspension is placed in a Sedgwick-Rafter counting cell and counted under the $\frac{2}{3}$ inch objective."

In special studies where long time samples can be taken the filtration of large volumes of air through a Soxhlet paper thimble (Mariner and Hoskins, 1915) or the study of the dry solids which accumulate in an open container of water during a period of several weeks (Whipple and Whipple, 1915) may yield valuable information.

BACTERIA.

The number of bacteria in the air does not appear to be a factor of any great sanitary significance. In special cases, however, as in the study of dairy conditions, it may be of interest.

The sand filter method, originally used by Petri, has proved essentially sound in principle. It was recommended in our 1909 report and again, after careful studies of alternative processes, in 1912.

One modification has been made in the apparatus since 1912 which is so clearly an improvement as to warrant immediate adoption. The layer of sand in the filters as previously used was supported on a perforated rubber stopper in a straight section of glass tubing, and the aspiration was applied to a small glass tube passing into the rubber stopper. It was clearly essential that the stopper should fit tightly, which meant that the apparatus must be sterilized in steam. Ruehle (1915) points out that the steam sterilization causes caking of the filter sand and thus introduces appreciable errors in analysis. Ruehle therefore made the suggestion that the rubber stopper should be eliminated and the small aspirating tube fused into the larger one.

We therefore recommend that for the study of bacteria in air there should be used a glass tube of 15 mm. in diameter and 70 mm. long with a smaller tube 6 mm. in diameter and 40 mm. long fused into one end. On the shoulder at the joint between the tubes rests a plug of cotton supporting a layer of sand 10 mm. deep. The sand should be capable of passing a 100 mesh sieve but not a 200-mesh sieve. The opposite or inlet end of the larger tube is stoppered by a cork stopper (which need not be exactly tight) perforated by a glass tube 6 mm. in diameter and 40 mm. long bent at an angle of 45° to prevent direct precipitation of dust particles into the filter tube.

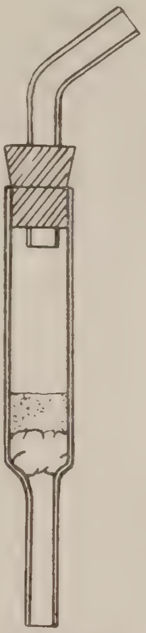

Fig. 5. Filter for collecting bacteria from air. (Ruehle type.)

Five cubic feet of air should be drawn through the filter by the use of an aspirator of known volume, preferably one of the double or continuous type, or by the use of some form of pump and meter. A convenient and ingenious sampling pump was made by Wallace and Tiernan of New York City for the study by Baskerville and Winslow (1913) of the air of New York City schools. After filtration the sand should be shaken out into 10 cc. of sterile water, and after thorough shaking aliquot portions of the water should be plated on ordinary nutrient agar.

The use of lactose-fermenting streptococci as special indices of mouth pollution in the air has been suggested by Gordon (1904); and recent studies by Nolte (1914) and Winslow and Browne (1914) indicate that it may have a real value. In case it is desired to make this test the standard procedure may be used with the substitution of litmus lactose agar for plain agar. Characteristic streptococcus colonies (small, acid colonies) should be fished to agar and identified by their typical veil-like surface growth, microscopic appearance (cocci in pairs or chains) and production of acid in lactose broth. A large number of air samples must be taken in parallel as these organisms are often found only to the number of 10 per 100 cubic feet of air.

CARBON DIOXID.

The amount of carbon dioxid in the air, while not a measure of any necessarily harmful condition, is a convenient index of the rate of air change in an occupied room. A high carbon dioxid value indicates stagnation and liability to stale odors and overheating.

The Petterson-Palmquist apparatus has been generally accepted as standard for the determination of carbon dioxid in American sanitary investigations. It can now be obtained from Eimer and Amend and many other dealers. In the hands of a skilled operator an analysis can be obtained in five minutes, and for careful work this seems to be the best instrument available. The principle involved is the measurement of a given volume of air, the absorption of the contained carbon dioxid in caustic potash solution, and the re-measurement of the volume of air at the original pressure in a finely graduated capillary tube, the difference in volume representing the absorbed carbon dioxid. The instrument must be carefully adjusted to maintain a uniform temperature and pressure, and the details of manipulation can only be mastered by considerable practice with the instrument in hand.

Another apparatus which operates on the same principle is that described by J. S. Haldane in the *Journal of Hygiene* for 1906, p. 74. This apparatus is not only cheaper but much more portable and is specially suited for the examination of samples in the field. It may be obtained from F. P. Rittenhaus and Company, 53 A Huntly Street, Tottenham Court Road, London, W. C., and can also be made up by other instrument makers.

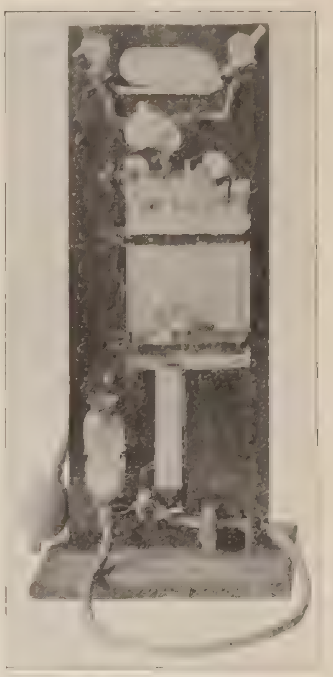

Fig. 6. Petterson-Palmquist Apparatus for Determination of Carbon Dioxid.

It should be noted that the Haldane apparatus is made in two forms, one for use in mines where the carbon dioxid values are high. The mine apparatus is not sensitive enough for ordinary use. Even the type of Haldane apparatus designed for use with ordinary air is less sensitive than the

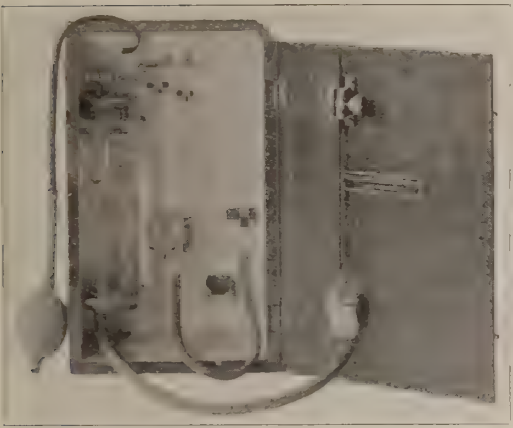

FIG. 7. Haldane Apparatus for Determination of Carbon Dioxid.

Petterson-Palmquist, reading accurately to one part in 10,000 instead of half a part.

The chief merit of the Petterson-Palmquist apparatus is in this greater accuracy due to its more readable scale and to the presence of the bubble manometer, which can be read more accurately than the height of the caustic solution in the Haldane tubes. The greatest objection to the Petterson-Palmquist apparatus in its present marketed form is its weight and cumbersomeness. It is not readily portable. Further the very bubble manometer, which gives it its superior accuracy, is a drawback in operation from the attention it demands to preserve it intact and the difficulty caused by inadvertently drawing the kerosene bubble into the measuring pipette or the air manometer.

The Haldane apparatus is far superior from the standpoint of portability. It is compact and weighs very little. In two respects besides its lower accuracy it may be judged inferior to the Petterson-Palmquist. (1) It possesses rubber connections between the measuring pipette and the caustic reservoir and between the caustic reservoir and the air equalizing chamber. These tubes are of course under varying positive and negative pressures during the act of washing the air sample in the caustic reservoir. Unless the joints are absolutely tight the volume of the air sample may be altered, thus throwing out the final carbon dioxid reading. (2) The caustic solution is at all times in contact with rubber tubing. This is a disadvantage when the apparatus is first used since some sulphur may be given off by the fresh rubber and the oxidation of this sulphur at the expense of the air sample will result in too high readings. The addition of fresh caustic, however, removes this source of error.

When samples are to be collected and brought to the laboratory for analysis the Petterson-Palmquist is undoubtedly the most accurate and should continue to be used as a standard procedure. For analyses in the field, on the other hand, the Haldane apparatus is far more convenient by reason of its lighter weight and greater compactness, and may be used to advantage especially if controlled by occasional comparison with the Petterson-Palmquist.

It does not seem necessary to reproduce here the detailed procedure for using the Petterson-Palmquist and Haldane apparatus. The manipulation of both is fully described in standard textbooks,- for example on pages 673–678 of Rosenau's Preventive Medicine and Hygiene (Rosenau, 1916).

When samples are to be collected in the field for subsequent analysis in the laboratory the method of collection must be carefully controlled. We reproduce here the recommendations made on this point in our 1912 report.

"Samples are collected in two-ounce, glass-stoppered bottles of clear glass if the analysis is not made with the portable apparatus on the spot. These bottles hold about 70 cc., which is enough air to make two analyses, in case it should be necessary—and it is always advisable—to repeat determinations. The stopper of each bottle is greased with petrolatum, or with a mixture of petrolatum and soft paraffine which will spread readily under pressure; and after the sample is taken, the stopper should be turned round and pressed down until no air channels are visible in the petrolatum. The stopper is held in position by a stout elastic band passed over it, and a gummed label is placed on the bottle.

"The bottles *must* be dry, and they should be clean. They should be rinsed with clean (preferably distilled) water and completely dried. If a bottle is wet and dirty an appreciable amount of CO_2 may be produced or some may disappear by bacterial action. If, on the other hand, the bottle is wet and clean, carbonic acid gradually disappears, as it is absorbed by alkali dissolved out of the glass by the water. In *dry* bottles, even though dusty inside, no sensible alteration takes place within a fortnight or more.

"The sample may be collected as follows: One end of a piece of rubber tubing, two or three feet long and one eighth or one quarter of an inch in diameter, is introduced to the bottom of the bottle, the other end being held in the mouth. A deep breath is then sucked in through the tube, so that the bottle is completely washed out by the surrounding air. The tube is removed while the air is being still sucked in, so as to avoid any risk of the breath passing backward into the bottle. The stopper is then inserted, turned around, and secured as already described, and particulars written on the label. Care must, of course, be taken that the sample be not contaminated in any way by the presence of persons or lamps. If it is desired to take samples at some distance from the operator, the plan may be varied by fitting the breathing tubes by a glass connection to one of the holes in a double bored rubber stopper which will just fit the bottle. Into the other hole, and ending just below the stopper, should be fitted another tube through which the air enters. If this second tube has great length, several breaths should be sucked through in succession, in order to entirely displace the air originally contained in the tube.

"Samples may be first collected in large rubber bulbs, such as are used with the Paquelin cautery or the sphygmomometer, and then transferred by passing the outlet tube to the bottom of the bottle. If the bulb holds 800 or 1,000 cc. there need be no fear about completely displacing the original air of the bottle. This method has the advantage that one sample of the air may be collected from many points in a room, and will in consequence be an average sample.

"The water siphon method, the steam vacuum method, and others discussed in our earlier report have the disadvantage of a wet container. This may not matter if the analysis is to follow immediately upon the collection, but it is not recommended where any considerable interval is to elapse.

"When larger containers than can be manipulated readily by breathing are to be used, some sort of a small hand bellows or suction pump is recommended for displacing the air in the container.

"Care must be taken in transferring the air sample to the apparatus, that there is no contamination. A method which has proven very satisfactory and is free from sensible error in the use of the Petterson-Palmquist method of analysis is as follows:

"Remove the stopper of the bottle containing the sample to be analyzed under a saturated solution of pure sodium chlorid. A little air will escape or a little of the solution will enter and by this the pressure in the bottle will be equalized to that without. Lift the bottle until the fluid in the neck is level with the surface of that in the basin. Slip a finger over the mouth of the bottle and transfer to any convenient stand near the mouth of the pipette. Slip the finger off sideways and immediately insert a doublebored rubber stopper which will fit snugly. This stopper should be previously made ready for use by inserting two small glass tubes through its bores, one of which will reach well toward the bottom of the bottle, and one of which ends just below the stopper. To the longer glass tube is attached a rubber tube which acts as a siphon leading from a large bottle of saturated sodium chlorid solution placed at a higher level. This siphon is kept always full of the solution which is held back by a pinch-cock. To the shorter glass tube is attached a very narrow rubber tube (a small catheter with a conical tip answers best) which will reach to the mouth of the apparatus. As soon as the stopper is in place, press the pinch-cock, thus allowing the salt solution to flow into the sampling bottle and causing the air to flow out through the small tube. When all of the air originally contained in the tube has been displaced, the free end is attached to the pipette, the mercury lowered, and the air let in, being forced out of the bottle by the flowing salt solution.

"After equalizing the pressure in the bottle by the process described, there is no sensible interchange of gases during the moment of removing the finger and inserting the rubber stopper, and no determinable error in the subsequent determinations of CO_2."

SPECIAL POISONOUS GASES.

In air polluted by the imperfect combustion of illuminants, carbon monoxid may be present in dangerous amounts, while the fumes from various industrial processes may contribute to the atmosphere carbon monoxid, methyl alcohol, sulphur dioxid, benzol, lead and arsenic compounds and the like in appreciable proportions.

The poisonous substances which might be present are so numerous that we have not felt it worth while to cite them in detail. Special attention has, however, been paid to this subject in the laboratories of the United States Public Health Service and the following references may be cited as giving the more important procedures which at present seem best suited for practical sanitary use:

Carbon bisulphid and anilin and other amido, nitro and chlor derivatives of benzol and its homologues are the most important substances likely to be found in addition to those listed below, but the committee does not feel prepared to recommend any procedures as satisfactory for the determination of these constituents.

Collection of Samples.—For the collection of samples for the absorption of certain constituents from gaseous mixtures the absorption bulb described by Atherton Seidell (1913) will be found of wide usefulness.

Carbon Monoxid.—The determination of carbon monoxid can be made most accurately by the iodine pentoxid method as described by Seidell (1914).

Methyl Alcohol.—For this determination the fuchsin bisulphite method recently described by Elvove* seems most promising.

Sulphur Dioxid.—Seidell and Meserve (1914) have worked out a method for the direct titration of sulphur dioxid with N/1,000 iodine which is excellently suited for the determination of minute amounts of this gas.

Benzol.—Benzol has been determined by Harbeck and Lunge (1898) by aspirating the air through a mixture of concentrated sulphuric and fuming nitric acids (equal parts), neutralizing with caustic soda, extracting the dinitro-benzene thus formed with ether, and weighing the resulting crystalline product.

Otto Pfeiffer (1904) uses a similar procedure but reduces the di-nitro benzene with an excess of stannous chlorid, titrating the excess with iodine.

Dennis and McCarthy (1908) absorb in nickel ammonium cyanid solution in a regular gas analysis apparatus. This method is good only for concentrations of the benzol vapor sufficient to be read directly in a gas burette and is subject to certain errors pointed out by Harding and Taylor (1910).

Metals.—In special cases calling for the determination of metals, either as volatile products or as dust, the necessary quantity of air may be passed through suitable absorption bulbs with dilute nitric acid, or the residue from the dust absorption apparatus may be used. The separation and determination of the metals may be made according to any suitable procedure, such as is described in any standard work (Fresenius, 1906; Treadwell, 1915).

Specially sensitive colorimetric methods are available for iron, copper and lead (Committee on Standard Methods for the Examination of Water and Sewage, 1912).

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* To be published in the *Journal of Industrial and Engineering Chemistry*.

Copper and lead occurring together may be separated electrolytically (Smith 1894; Classen, 1913) and determined separately as above.

For arsenic the Marsh test (Fresenius, 1883 and 1906) especially with standards prepared according to the procedure of the British Joint Commission (1902) is accurate for minute quantities.

The modified Gutzeit test of the new U. S. P. (1910) as described more completely by Smith (1912) is also serviceable and simpler than the Marsh test for a few determinations only, and is sufficiently quantitative for all ordinary purposes.

C.-E. A. Winslow, *Chairman.*
T. R. Crowder.
W. P. Mason.
E. B. Phelps.
G. C. Whipple.

References.

Baskerville, C. and Winslow, C.-E. A. 1913. The Air of New York City Schools. Report of the Committee on School Inquiry, Board of Estimate and Apportionment, City of New York, III, 611.

British Joint Commission. 1902. Detection and Approximate Estimation of Minute Quantities of Arsenic in Beer, Brewing Materials, Foodstuffs and Fuels. *Journal of the Society of Chemical Industry,* XXI, 94.

Chicago. 1915. Report of the Chicago Commission on Ventilation.

Classen, A. 1913. Quantitative Analysis by Electrolysis. Trans. from 5th German edition by W. T. Hall.

Committee on Standard Methods for the Examination of Water and Sewage, Second Edition. 1912. Laboratory Section American Public Health Association.

Dennis, L. M. and McCarthy, E. S. 1908. The Determination of Benzene in Illuminating Gas. *Journal of the American Chemical Society,* XXX, Pt. I, 236.

Fresenius, K. R. 1906. Quantitative Chemical Analysis. Trans. from 6th German edition by A. I. Cohn.

Fresenius, W. 1883. Der Arsengehalt des Glases als eine Fehlerquelle bei der Nachweisung von Arsen. Zeitschrift für analytische Chemie, XXII, 397.

Gordon, M. H. 1904. Report on a Bacterial Test for Estimating Pollution of Air. Supplement to the XXXII Annual Report of the Local Government Board of Great Britain, containing the Report of the Medical Officer for 1902–03, 421.

Great Britain. 1915. First Report of the Departmental Committee on Lighting in Factories and Workshops. Vol. I, Report and Appendices.

Griffith, O. W. 1915. Ventilation and Housing. *The Medical Officer,* XIII, June 19, 1915, 273.

Harbeck, E. and Lunge, G. 1898. Quantitative Scheidung von Äthyler und Benzoldampf. Zeitschr. f. anorganische Chemie, XVI, 26.

Harding, E. P. and Taylor, C. 1910. A Comparison of the Efficiency of Otto Pfeiffer's and Dennis and McCarthy's Method for Determining Benzene in Illuminating Gas. *Journal of Industrial and Engineering Chemistry,* II, 345.

Heberden, W. 1826. An Account of the Heat of July, 1825; together with Some Remarks upon Sensible Cold. Trans. Roy. Soc., London, 1826, Part II, 69.

Hill, L. 1913. The Physiology of the Open-Air Treatment. *The Lancet,* CLXXXIV, May 10, 1913, I, 283.

Hill, L., Griffith, O. W. and Flack, M. 1916. The Measurement of the Rate of Heat-loss at Body Temperature by Convection, Radiation and Evaporation. Phil. Trans. Roy. Soc. London, Series B, CCVII, 183.

Howe, E. C. 1916. The Determination of Relative Humidity. *Science,* N. S. XLIV, 396.

Mariner and Hoskins. 1915. Laboratory Report on Air Analysis. Report to Chicago Association of Commerce, Committee on Smoke Abatement and Electrification of Railway Terminals.

Marvin, C .F. 1912. Psychrometric Tables for obtaining the Vapor Pressure, Relative Humidity and Temperature of the Dew-point. Bulletin No. 235, U. S. Weather Bureau.

Nolte, A. G. 1914. The Identification of the Most Characteristic Salivary Organism and its Relation to the Pollution of Air. Annals Missouri Botanical Garden, I, 47.

Palmer, G. T., Coleman, L. V., and Ward, H. C. 1916. A Study of Methods for Determining Air Dustiness. AMERICAN JOURNAL OF PUBLIC HEALTH, VI, 1049.

Palmer, G. T. 1916. A New Sampling Apparatus for the Determination of Aerial Dust. AMERICAN JOURNAL OF PUBLIC HEALTH, VI, 54.

Pfeiffer, O. 1904. Bestimmung von Benzoldampf im Leuchtgas. Chemische Zeitschrift, XXVIII, 884.

Rideal, E. K. and Hannah, A. 1915. A New Chemical Hygrometer. *The Analyst*, XL, 48.

Rosenau, M. J. 1916. Preventive Medicine and Hygiene. Second edition. D. Appleton and Son. New York.

Ruehle, G. L. A. 1915. Methods of Bacterial Analyses of Air. *Journal of Agricultural Research*, IV, 343.

Schereschewsky, J. W. and Tuck, D. H. 1915. The Hygienic Conditions of Illumination in Workshops of the Women's Garment Industry. Public Health Bulletin, No. 71. United States Public Health Service, II, 105

Seidell, A. 1913. A Simple Form of Absorption Bulb. *Journal of the American Chemical Society*, XXXV, 1888.

Seidell, A. 1914. Improvements in the Iodine Pentoxide Method for the Determination of Carbon Monoxide in Air. *Journal of Industrial and Engineering Chemistry*, VI, 321.

Seidell, A. and Meserve, P. W. 1914. The Determination of Minute Amounts of Sulfur Dioxide in Air. *Journal of Industrial and Engineering Chemistry*, VI, 298.

Smith, C. R., 1912. U. S. Dept. Agr. Bur. Chem. Cir. 102.

Smith, E. F. 1894. Electro-Chemical Analysis. Second edition.

Treadwell, F. P. 1915. Analytical Chemistry. Trans. by W. T. Hall. Vol. II. Fourth edition.

United States Pharmacopœia, IX, 584.

Whipple, G. C. and Whipple, M. C. 1915. Studies in Air Cleanliness. Transactions American Society of Heating and Ventilating Engineers, XXI, 211.

Winslow, C.-E. A. and Browne, W. W. 1914. The Microbic Content of Indoor and Outdoor Air. *Monthly Weather Review*, XLII, 452.

Winslow, C.-E. A. 1916. The Kata Thermometer as a Measure of the Effect of Atmospheric Conditions upon Bodily Comfort. *Science*, N. S. XLIII, 716.

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HEALTH LABORATORY ORGANIZATION.

W. H. Park, New York (*Journal A. M. A.*, December 30, 1916), gives his views founded on his experience as director of the Health Department Laboratory of New York City for the past twenty-two years. He remarks on the different conditions which exist between the health laboratories of small and large cities. In the former, all public laboratory work is necessarily combined, and the question of whether it is wise to unite the chemical and bacteriologic laboratories or to separate them can only be answered after knowing the local conditions. When the laboratory becomes extensive, the separation frequently develops, each division being placed in charge of an assistant director or the general chemical work being removed to some special bureau. In national and state governments the subdivision is carried still further. The activities of health departments have broadened greatly in the last twenty years. The conception that the duties of a sanitary board include the scientific investigation of all matters connected with infectious diseases has been accepted by all enlightened communities. There are the best of reasons for including in the laboratory budget the appropriations for scientific research. Practical additions are thus frequently made to our knowledge of the prevention of disease which can be immediately applied, and a higher class of experts can be obtained who are better able to test the value of new discoveries, etc. Park discusses the functional divisions of the laboratory and the duties of the assistants. The director and first assistant director of the laboratory should be in touch with all the work and each take an active part in at least one division of it, and all the assistant directors and workers filling positions of responsibility should know in a general way about the work in all the divisions so as to be fitted to fill vacancies and prevent interruptions, and the minor workers who have ability should also have some knowledge of at least one other line. The higher workers should all be expected to do some research work, and Park's experience convinces him that the omission of provisions for this kind of work is a great mistake.

MINUTES OF THE FORTY-FOURTH ANNUAL MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

CINCINNATI, OHIO, OCTOBER 24 TO 27, 1916.

FIRST SESSION.

The Forty-fourth Annual Meeting of the Association was called to order at the Hotel Gibson, October 24, 1916, 9 a. m., by President John F. Anderson. The minutes of the 1915 meeting having been published in the JOURNAL of the Association, reading was by unanimous consent dispensed with. The Secretary announced that President John F. Anderson had appointed the following Committee on Resolutions: Dr. W. A. Evans, Chairman; Dr. H. D. Holton, Dr. Peter H. Bryce, Dr. M. P. Ravenel, and Dr. J. A. Hayne. On motion the meeting adjourned.

J. F. ANDERSON,
President.
SELSKAR M. GUNN,
Secretary.

SECOND SESSION.

The meeting was called to order at 2 p. m. by the President. The following papers were read:

Symposium on Mental Hygiene. (Under the Auspices of the Sociological Section.)

Psychiatric Clinics in the Schools. Dr. J. T. MacCurdy, Consulting Psychiatrist, Institution for Feeble-Minded, Randall's Island, N. Y.

The Relation of Alcohol and Syphilis to Mental Hygiene. Dr. Frankwood E. Williams, Secretary, Massachusetts Society for Mental Hygiene, Boston, Mass.

The Relation of Social and Economic Factors to Mental Hygiene. Dr. C. MacFie Campbell, Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital, Baltimore, Md.

Alcohol—A Public Health Problem. Dr. Haven Emerson, Commissioner of Health, New York City.

The following took part in the discussion: Mr. E. A. Moree, Doctor Sears, Dr. J. W. Schereschewsky, Doctor Sutton, Mr. Baldwin, Dr. J. D. Robertson, Doctor Fowler, Doctor McCurdy.

The meeting then adjourned.

J. F. ANDERSON,
President.
SELSKAR M. GUNN,
Secretary.

THIRD SESSION.

The meeting took place in the Emory Auditorium, 8 p. m. The program was opened by musical selections by the Cincinnati Symphony Orchestra. His Honor, the Mayor of Cincinnati, then delivered an address of welcome. He was followed by Dr. George Fackler of the Cincinnati Board of Health, who introduced the President of the Association, Dr. John F. Anderson, who delivered his presidential address on "Some Important Public Health Problems." At the conclusion of his address the orchestra played additional selections.

The meeting then adjourned.

J. F. ANDERSON,
President.
SELSKAR M. GUNN,
Secretary.

FOURTH SESSION.

The meeting was called to order in the Hotel Gibson, on Wednesday, October 25, 9 a. m. President John F. Anderson in the chair. The following resolution was presented by the Resolutions Committee with recommendations for its adoption:

In view of the fact that infantile paralysis has existed for several months and still exists in the United States and Canada, taking on in some localities an epidemic character; that considerable anxiety is expressed by the public generally, and that they, the public, the physicians and the health authorities may well expect an authoritative statement upon the subject from this Association in annual convention assembled, be it

Resolved, That the President be forthwith authorized to appoint a small committee of specialists and of those who have had experience of the disease with instructions to meet immediately and to prepare a report of the present actual knowledge of the cause of the disease, the manner and agents by which it is spread, the best methods of treatment, and the best preventive measures. And that this committee submit its report before the close of this annual meeting; and that such report be given to the public immediately.

The resolution was adopted and Doctor Anderson appointed the following committee: Dr. Haven Emerson, Chairman, Dr. Wade H. Frost and Dr. A. J. Chesley.

Vice-President Charles J. Hastings then took the chair. The following papers were then presented: The Report of the Committee on Cold Storage. On motion the report of the committee was referred to the Executive Committee.

Vice-President Gillette then took the chair. The following papers were then presented:

The Coördination of Public and Private Services in Public Health Nursing. Mary Beard, President of the National Organization for Public Health Nursing.

What the Public Health Nurse and her Education Mean to the Modern Health Officer. Dr. Charles A. Hastings, President of the Canadian Public Health Association, Toronto, Ontario.

The papers were discussed by Dr. Josephine Baker, Dr. Michael M. Davis, Dr. P. M. Hall, Doctor Sheffield, Dr. P. S. Schenk, Dr. N. D. Stovall, Mr. Baldwin, Miss Crandall, Dr. W. H. Peters, Dr. White, Mr. W. G. Kirschbaum, and Miss Mary Beard.

Vice-President Hastings then took the chair. The following paper was then presented: Some Essential Statistics of Leprosy throughout the World. Frederick L. Hoffman, Statistician, The Prudential Insurance Company of America, Newark, N. J. The paper was discussed by Dr. C. C. Berl, Dr. Oscar M. Dowling, Dr. F. H. Edsall, and Dr. Maurice Ostheimer.

President Anderson then took the chair. The following papers were then presented:

The History of the Association. Dr. Peter H. Bryce, Department of the Interior, Ottawa, Ontario.

The Present Condition of the Association. Prof. Selskar M. Gunn, Department of Biology and Public Health, Massachusetts Institute of Technology.

A Prophecy as to the Future of the Association. Lee K. Frankel, Ph.D., Sixth Vice-President, Metropolitan Life Insurance Company, New York, N. Y. On motion the meeting adjourned.

J. F. ANDERSON,
President.
SELSKAR M. GUNN,
Secretary.

FINAL SESSION.

The meeting was called to order by the President at the Hotel Gibson, Friday, October 27, 2 p. m.

The Secretary then read the Report of the Advisory Council.

REPORT OF THE ADVISORY COUNCIL.

The Advisory Council of the American Public Health Association was called to order by the Secretary at 12.30 p. m. in Parlor H., Hotel Sinton, Cincinnati, Ohio, Thursday, October 26. Fifty-three members were present:

Dr. Frederick Montizambert was nominated and elected Chairman, and Dr. John H. Landis was nominated and elected Secretary. The following officers for 1917 were nominated by ballot for the office stated immediately preceding their names: *President*, Dr. W. A. Evans, Chicago, Ill.; *first vice-president*, Dr. John H. Landis, Cincinnati, Ohio; *second vice-president*, Dr. Maurice Seymour, Regina, Sask.; *third vice-president*, Dr. Manuel Iglesias, Vera Cruz, Mexico; *treasurer*, Dr. Lee K. Frankel, New York City. Directors to serve for three years: Dr. Hoyt E. Dearholt, Wisconsin; Mr. Henry Vaughan, Michigan; Dr. W. R. Batt, Pennsylvania; Dr. R. B. Fitz-Randolph, New Jersey and Delaware; Dr. John S. Fulton, Maryland, and District of Columbia; Dr. Henry Boswell, Mississippi, Alabama, Georgia, and Florida; Dr. W. A. Sawyer, California and Nevada; Dr. John Dill Robertson, Illinois; Dr. James A. Hayne, North and South Carolina; Dr. A. J. Douglas, Canada. Director to serve for one year to fill the unexpired term of Dr. B. L. Arms who had moved out of his district, Dr. Robert H. Bishop. Jr., Ohio. The following honorary members were nominated: Dr. C. V. Chapin, Providence. R. I., Dr. Cressy L. Wilbur, Albany, N. Y., Dr. Samuel H. Durgin, Milbrook, Mass.

Respectfully submitted,
FREDERICK MONTIZAMBERT,
Chairman.
JOHN H. LANDIS,
Secretary.

It was moved that the recommendations of the Advisory Council be accepted and that under suspension of the rules the Secretary be authorized to cast one ballot for the nominees recommended. The motion was seconded and unanimously adopted and a ballot cast in accordance therewith and the gentlemen declared elected.

The following resolution was presented by the Committee on Resolutions with the recommendation that it be adopted by the Association:

Resolved, That the chair appoint a permanent committee of five on Professional Education for Public Health Work. The term of one member shall expire each year, and his successor shall be appointed for a term of five years. The duties of the committee shall include a standardization of the courses in this field, both in medical schools, and those schools training professional public health workers. It should be the aim of this committee to coöperate with the Council on Medical Education of the American Medical Association and the Association of American Medical Colleges in order to secure universal adoption of such standardized courses and an increase of the amount of attention paid the subject. The committee should also work towards a uniformity in the degrees or other awards conferred upon candidates at the successful completion of professional courses for public health workers.

The resolution was unanimously adopted.

The following resolution was presented by the Committee on Resolutions with the recommendation that it be adopted by the Association:

Resolved, That the American Public Health Association endorses the principle that manufacturers of all patent medicines be required to file the formulae of all such preparations with the Bureau of Chemistry, Department of Agriculture, and with other proper state and municipal authorities in the United States and with the proper authorities in Canada, Mexico and Cuba.

The resolution was unanimously adopted.

The following resolution was presented by the Committee on Resolutions with the recommendation that it be adopted by the Association:

WHEREAS, The laws and ordinances, and rules and regulations governing the production and sale of milk and milk products are so numerous and lacking in uniformity as to cause confusion and discourage the producer; be it

Resolved, That this Association appoint a committee of three to draft rules and regulations, based upon the most recent investigations, which will ensure to the consumer a clean and safe milk supply, and that this committee be empowered to meet and confer with like committees from other associations interested in this subject; provided that in no case shall this committee endorse measures at variance with the standards already adopted by this Association.

The resolution was unanimously adopted.

The following resolution was presented by the Committee on Resolutions with the recommendation that it be adopted by the Association:

WHEREAS, There is urgent need for an intensive campaign of public health education under the auspices of a properly constituted public health association, including within its membership a large proportion of laymen, and,

WHEREAS, It seems unwise to foster the organization of additional new public agencies, be it

Resolved, That the President be and hereby is empowered and instructed to appoint a committee of three to take up with the American National Red Cross and such organizations as may seem proper to the Committee, the question of such a public health propagandum.

The resolution was unanimously adopted.

The following resolution was presented by the Committee on Resolutions with the recommendation that it be adopted by the Association:

Whereas, United States Senate Bill 4086, providing for the establishment of a national leprosarium and the more humane care of lepers than is possible under state and municipal administration, on account of the exceptional nature of the disease, and,

Whereas, Said bill has been favorably reported by the Senate Committee on Public Health and National Quarantine, be it

Resolved, By the American Public Health Association in Annual Meeting assembled, that we most heartily and unanimously approve of the principle of this bill and respectfully recommend its early enactment into law as a measure called for by the highest considerations of public policy and the welfare and needs of those concerned.

The resolution was unanimously adopted.

The following resolution was then introduced:

Whereas, There may from time to time develop unusual conditions affecting the public health and economic welfare of the people represented in this Association, and

Whereas, In the particular areas affected the responsible public health authorities feeling the need of assistance in combating such conditions, may call upon the American Public Health Association for the same, be it

Resolved, That it is expedient for this Association to appoint a Select Standing Committee to act under such circumstances when so requested, and be it further

Resolved, That such Committee shall consist of five members nominated by each of the several Sections of the Association, which nominees the executive shall submit to the Association for approval, and be it

Resolved, That it shall become the duty of the President of the Association when formally requested by any properly constituted public health authority in any district so affected, to set apart with the consent of the Executive Committee, such members of the Standing Committee as are specially qualified to deal with the particular matter, or if thought advisable, the whole committee to investigate the situation and to advise such action as in its judgment would be best suited to meet the emergency in the interests of both the district affected and the country at large.

This resolution was referred to the Board of Directors for action.

The following resolution was presented by the Committee on Resolutions with the recommendation that it be adopted by the Association:

Resolved, That the executive be instructed to proceed in the steps necessary to secure the incorporation of the American Public Health Association in order to put it in a position to carry on business as a concern capable of holding property.

The resolution was unanimously adopted.

Dr. Haven Emerson, Chairman of the Special Committee on Infantile Paralysis then presented the Report of the Committee:

The report was unanimously adopted.

The following paper was then presented:

Death-Rates in Old and Young States. Dr. T. D. Tuttle, State Commissioner of Health, Seattle, Wash.

This paper was discussed by Mr. Rudolph Hering.

The following paper was then presented:

Birth-Control as a Medical, Social, Economic and Moral Problem. Dr. S. Adolphus Knopf, Professor of Medicine, Department of Phthisiotherapy, New York Post-Graduate Medical School and Hospital.

This paper was discussed by Dr. Ira S. Wile, Dr. J. H. Landis, Dr. J. N. Hurty, Dr. W. L. Holt, Dr. Louis I. Dublin, Dr. McCurrihan, Dr. J. W. Trask, and Dr. S. A. Knopf.

The following resolution was then presented:

Be it Resolved, That the President of the American Public Health Association is empowered to appoint a committee of five to study the federal and state laws of this country which permit duly qualified physicians to perform abortions under certain conditions, but make it criminal offense to give advice as to how to avoid conception, and, be it

Resolved, That this committee report its investigations at the next annual meeting with such recommendations as it deems advisable to lay before the Association.

This resolution was referred to the Board of Directors.

Dr. George W. Goler then took the chair. The following papers were then presented:

Malaria as a Public Health and Economic Problem. Surgeon John W. Trask, United States Public Health Service.

Saving Sight-Saving Citizens. Edward M. Van Cleve, Managing Director, National Committee for the Prevention of Blindness, New York City.

Mr. Van Cleve's paper was discussed by Dr. J. N. Stuckey and Dr. W. H. Peters.

The following paper was read by title:

A Year's Work in Hay Fever Eradication in the United States. W. Scheppegrell, M. D., President Hay Fever Prevention Association, New Orleans, La.

The following paper was then presented:

The Present Status of, and Necessity for Mouth Hygiene, Dr. Sidney J. Rauh, Chairman, Oral Hygiene Committee, Ohio State Dental Society, Cincinnati, Ohio.

The Secretary announced the following gentlemen which had been elected by the Board of Directors to the Executive Committee:

Dr. Peter H. Bryce, Dr. John S. Fulton, Dr. E. C. Levy, Prof. H. W. Conn.

The Committee on Resolutions then presented the following resolution with recommendation for its adoption:

Be it Resolved, That the thanks of the American Public Health Association be given to the Woman's Club of Cincinnati and other ladies of the city for their attention and constant courtesies extended to the visiting ladies of the Association, and be it

Resolved, That the thanks of the Association be given to Dr. J. H. Landis, Chairman, and to Drs. W. H. Peters and E. O. Smith of the local Committee of Arrangement for their efforts to receive the Association and supply facilities for carrying on its work, and for the arrangements for the social entertainment of its members and, be it

Resolved, That the thanks of the Association be extended to the State Board of Health of Ohio for their extension of courtesies to the members of the Association in holding the meeting of the Health Officers in Cincinnati during the Annual Meeting of the American Public Health Association.

The resolution was unanimously adopted.

The Association then adjourned to meet in New Orleans in 1917.

JOHN F. ANDERSON,
President.
S. M. GUNN,
Secretary.

REPORT UPON AN AUDIT OF THE AMERICAN PUBLIC HEALTH ASSOCIATION, FOR THE YEAR ENDED AUGUST 31, 1916.

October 9, 1916.

THE AMERICAN PUBLIC HEALTH ASSOCIATION,
755 Boylston Street,
Boston.

Gentlemen:

In accordance with your instructions, we have made an audit of the books and accounts of your Society for the year ended August 31, 1916.

We have examined all vouchers, bank statements, and checks for the year and have verified the various cash balances as of September 1, 1916. We found all payments supported by proper vouchers. We have tested footings, checked all postings, verified the trial-balances, and have ourselves drawn off the statement to be used in the printed report.

We present the results of our examination in the following exhibits:

Exhibit A—Balance Sheet as of September 1, 1916.

Exhibit B—Comparative Statement of Income and Outgo.

Exhibit C—Surplus Account.

EXHIBIT A.

It will be noted that this exhibit does not carry dues or advertising accounts-receivable, as did the parallel exhibit a year ago. It was found inexpedient to continue to carry dues and advertising upon an accrual basis and accordingly they were returned to the cash basis and the asset accounts closed forthwith. The cash basis of earnings does not give as accurate results theoretically but, after a year of experiment, it was found that the accrual basis afforded possibilities for errors and mistakes all out of proportion to the value of the information received. We advise that the income accounts be continued upon the cash basis for at least another year.

As Professor Gunn originally provided a part of the office equipment, it was in order that he should be reimbursed when the funds of the Association warranted the outlay. The liability of $77.05, shown on the exhibit, is the amount still due Professor Gunn on this account.

EXHIBIT B.

The Society has made a great financial gain in the current year over the preceding year as this exhibit shows. A loss of $2,829.31 has been turned into a profit of $30.53. This has been brought about both by an increase in income and a decrease in expenditures. On a strict operating basis (disregarding donations) the Society has made a gain over last year of nearly $4,000.00 on a total business of some $14,000.00, a truly remarkable and encouraging showing. The income has increased by 16 per cent. while the outgo has decreased by 11 per cent.

As an offset to this gain, it must be recorded, however, that owing to a change of system the journal printing account only carries eleven monthly printing bills.

Exhibit C.

The deficit a year ago was $990.48. The deficit this year is $1,789.99. In view of the fact that a small profit was made on the year's operations, why has the deficit increased so considerably? This question is answered by examining the charges shown in this exhibit. The accounts-receivable were written off in order to put the earnings back on a cash basis. This made a bookkeeping loss, of course, but it does not represent a true loss, because members and advertisers still owe their accounts. An adjustment had to be made in the equipment account covering an old misunderstanding when the account was originally set up. The inventory carried a year ago was found to be rather optimistically determined and this year it has been reduced to a bed rock basis, involving a heavy charge to surplus. While the deficiency, as a bookkeeping proposition, has grown, it is evident that the financial condition of the Society is better today than it was a year ago.

We found that the accounts had been carefully and, in the main, accurately kept. Some minor errors were found and corrected but the bookkeeping work as a whole has been good.

Very respectfully,

(Signed)

Harvey S. Chase & Company,
Certified Public Accountants.

EXHIBIT A—AMERICAN PUBLIC HEALTH ASSOCIATION BALANCE SHEET.

September 1, 1916.

Assets.

Cash:		
Treasurer's Account	$135.41	
Secretary's Account	49.19	
Petty Cash	25.00	
		$209.60
Salable Stock on Hand	150.00	
Office Equipment	789.93	
Deficit September 1, 1916	1,789.99	
		$2,939.52

Liabilities.

Due Rumford Press	$2,862.47	
Due Professor Gunn for Furniture	77.05	
		$2,939.52

EXHIBIT B—AMERICAN PUBLIC HEALTH ASSOCIATION.

Comparative Statement of Income and Outgo for Years Ended August 31, 1915 and 1916.

Income.

	1915.	*1916.*
Journal Subscriptions	$4,682.35	$5,104.60
Dues	3,625.00	4,617.53
Journal Advertising	2,230.44	2,327.53
Sales of Water Reports	782.73	890.10
Journal Copies	308.87	448.00
Milk and Air Reports	43.45	9.00
Transactions	38.00	11.50
Bound Volumes	24.70	46.45
Miscellaneous Income	66.04	176.27
Sales of Badges		147.00
Total Income	$11,801.58	$13,777.98

OUTGO.

JOURNAL Printing and Mailing	$5,185.80	$5,577.81
Salaries	3,868.52	2,752.58
Payroll	2,034.51	2,442.90
Convention Expense	1,100.71	338.65
Postage	1,063.15	736.74
General Expense	682.39	681.58
Rent	544.61	626.44
Stationery and Supplies	1,346.37	764.63
Travelling	190.88	43.90
Discounts	84.49	91.25
Commissions	68.60	148.45
Interest	42.01	
Refunds	33.71	59.38
Cost of Pamphlets Sold	170.14	288.28
Cost of Badges Sold		94.86
Total Outgo	$16,415.89	$14,647.45
Operating Loss	$4,614.31	$869.47
Add Donations	1,785.00	900.00
Final Net Loss,1915	$2,829.31	
Final Net Gain, 1916		$30.53

EXHIBIT C—AMERICAN PUBLIC HEALTH ASSOCIATION.

SURPLUS AND DEFICIT ACCOUNT, RELATING TO 1915 AND PRIOR.

Deficiency as Shown at Close of Business August 31, 1915	$990.48	
Reduction of Inventory from Figures Carried Heretofore	467.51	
Checks Received Last Year, Returned by Bank	6.00	
Furniture Values Reduced (Originally Incorrect)	166.90	
Real Deficiency at Close of Year (1915)		$1,630.89

1916.

Gain per Income Account	30.53	
Deficiency at Close of Year (1916)		$1,600.36

CHANGES IN BOOKKEEPING.

Accounts-Receivable, Dues, Closed off	$31.50	
Accounts-Receivable, Advertising, Closed off	199.43	
	$230.93	
Less "Advertising Reserve" Closed off	41.30	
Net Increase of Book Deficit by these Changes		189.63
Balance (deficiency) per Balance Sheet August 31, 1916		$1,789.99

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH.

THE regular quarterly meeting of the Massachusetts Association of Boards of Health was held in Holyoke, Mass., Thursday, October 19, 1916, with President Frank A. Woods M. D., in the chair.

It was voted to dispense with reading the records of the preceding meeting.

On recommendation of the Executive Committee the following new members were admitted: Henry E. Doonan, South Hadley Falls, Mass.; Forrest L. Leland, South Hadley Falls, Mass.; Charles W. Robertson, M. D., North Dana, Mass.; Herbert B. Lang, South Hadley, Mass.

The Executive Committee reported its election of Nominating Committee to report at the annual meeting, as follows: Mr. J. C. Coffey of Worcester, Prof. J. O. Jordan of Boston, Mr. W. S. Kirschbaum of New Bedford,

A communication was read from Mr. Seymour H. Stone, of the Society for the Prevention and Control of Tuberculosis, concerning the forcible isolation of incorrigible consumptives and it was unaminously voted on motion of Doctor Coolidge to indorse the same legislation as was recommended last year.

It was unanimously voted to continue as a committee for this bill the gentlemen who served so acceptably last year, Mr. Stone, Dr. Denny and Dr. Coolidge.

A letter was read from Dr. Gardner T. Swarts of Providence, R. I., expressing his regrets at his inability, on account of illness, to be present to read his paper.

Mayor John J. White of Holyoke then delivered the following address of welcome:

"*Mr. President, Members of the Massachusetts Health Board Association, Ladies and Gentlemen:*

"Those of you who have never been on top of this mountain before will have to accept my word for it that were it a clear day you would see from here the most beautiful sight that can be witnessed in any place in this or any other country. You would see our glorious city at the base of the mountain; you would see the splendid Connecticut valley and you would be like the man who when he looked at a very handsome woman was prompt to say he 'pitied the man who was blind.'

"The City of Holyoke welcomes you. We feel both honored and pleased to have our city chosen for your meeting, particularly at this time when we are suffering from an epidemic that seems to baffle medical skill and I hope—and we all hope—that today's discussion will help to solve the problem of the now much dreaded disease—poliomyelitis.

"While the weather man has been most unkind to us we hope by the warmth of our welcome to you and the repast that is coming for the inner man, that for the time the weather will be forgotten and that you will all go from here with the impression that Holyoke is what we Holyokers believe it to be—an ideal place to gather in convention, and should at any future time the question arise as to where shall you next meet, with one solid voice you will shout "Holyoke!"

"Ladies and Gentlemen, I welcome you; all Holyoke welcomes you. May your stay here with us be both pleasant and instructive, and I feel that it will. Forget the clouds outside and let the sunshine that will soon be brought in by the waiters be foremost in your minds."

The following program was then presented and on motion from the floor it was voted that the discussion be open to all present:

Paper—"A Common or Public Nuisance—The Tubercular Milch Cow." Dr. J. F. Winchester, Lawrence, Mass., Chairman American Veterinary Medical Association.

Paper—"What We Have Learned from the New York Epidemic of Anterior Poliomyelitis?" Dr. Charles F. Bolduan, Director, Bureau of Public Education, Department of Health, New York City.

On motion of Mr. John Ritchie, Jr., of Boston, the Association by a unanimous standing vote expressed its appreciation of the hospitality of the city of Holyoke through its Mayor, its Health Department and its Chamber of Commerce.

The meeting adjourned.

Francis H. Slack,
Secretary.

A COMMON OR PUBLIC NUISANCE—THE TUBERCULAR MILCH COW.

Dr. J. F. Winchester,
Lawrence, Mass., Chairman American Veterinary Association.

Read before the Annual Meeting of the Massachusetts Association of Boards of Health, Holyoke, Mass., October 19, 1916.

I HAVE the honor as well as the privilege to call attention to *centers* of the *cause* of the most dread disease in mankind that is preventable.

The title I have taken is "A Common or Public Nuisance, the Tubercular Milch Cow."

"A common or public nuisance is one which tends to the annoyance of the public generally, and is therefore to be redressed by forcible abatement, or by an action by the state."

That the tubercular milch cow is a common or public nuisance has been proven by the demonstration of the bacilli of Koch, or the tubercular bacilli, in the milk of such animals. That the milk from such animals is an annoyance to the public generally, is shown by the per cent. of human beings whose death has been caused by or who have been made cripples by its use. The abatement by force will not be tolerated, but legislative action can correct the nuisance.

That the bovine type of Koch bacillus does appear in the human subject, causing death and disability, has been demonstrated by various investigators.

Eastwood and Griffith, in Great Britain, have made a report of the relative distribution of the various strains of tubercle bacilli in human bone and joint tuberculosis.

For the investigation, the material examined was removed directly from an affected joint or bone, or from an abscess in the neighborhood of such lesion. Out of a total of 261 patients, 55 or 21 per cent. were bovine cases. Of these only 3 were over 16 years of age. One hundred and fifty-five cases were examined under 10 years of age, and 45 or 29 per cent. were bovine.

Dr. M. J. Ravenel, of the University of Missouri, writes, "The transmission of tuberculosis from cattle to man through milk is no longer doubted by any one. The danger is particularly great in children under 5 years of age, but is marked in all children from birth to 16 years, *apparently diminishing* after that time."

Dr. William H. Park gives a summary of patients, who have died from tuberculosis, as follows:

Adults, 16 years and over, 955 cases; 940 human, 15 bovine. Children, 5 to 16 years, 177 cases; 131 human, 46 bovine. Children, under 5 years, 368 cases; 292 human, 76 bovine.

Dr. Park further states that 10 per cent. of the fatal cases of tuberculosis among children was due to bovine bacilli; that of all the children which were fed with raw dairy products one-half died of bovine bacilli; and that about one-half of all the people, younger children and older children, that had gland tuberculosis, had bovine infection.

Dr. Delepine says, "Taking all evidence into consideration, it is possible to say, without fear of exaggeration, that not less than 25 per cent. of the children suffering from tuberculosis under 5 years of age, suffer from tuberculosis of bovine origin, and that this rate is much lower than one based on probabilities would be."

Dr. Mitchell, of Edinburgh, examined 72 cases of children suffering from cervical tuberculosis, and of these 65 or 90 per cent. showed bovine infection. There were 38 cases under 5 years of age, and of these 35 were infection from the bovine and only 3 from the human. Some of these cases led to death later, but all of them led to more or less disease and deformity.

Infant mortality in this state under one year of age, for 1913, was 10,086 from all causes, while 4,180 deaths are registered as being due to consumption that year, but the ages of the victims were not recorded in the report.

Clinically it is impossible to tell whether a patient afflicted with tuberculosis, is infected with the bovine or human type of the tubercle bacilli.

Professor Eber, Director of the Veterinary Institute Laboratories at Leipsic, has repeatedly shown that it is possible to so alter the human type of tubercle bacillus, by systematic passage through animals, that, with the means at present at our disposal, they cannot be distinguished from bacilli of the bovine type.

His researches furnish abundant evidence that the two types of tubercle bacilli, the human and the bovine, are not types of sub-species with constant characters, but rather varieties of one and the same bacillus with relatively variable characters. He recognizes that the bacilli cultivated directly from the human or bovine sources possesses certain biological characteristics, which permit of a distinction in the majority of cases, between the human and bovine type.

The law that deals with the detection of tuberculosis in cattle is as follows: "Tuberculin as a diagnostic agent for the detection of tuberculosis in domestic animals shall be used only upon cattle brought into the Commonwealth, and upon cattle at Brighton, Watertown, and Somerville, Mass.; but it *may* be used as such diagnostic agent on any animal in any other part of the Commonwealth, with the consent in writing of the owner or person in possession thereof, and upon animals which have been condemned as tuberculous upon physical examination by a competent veterinary surgeon."

Tuberculin is used upon foreign cattle, but *not* upon native or Massachusetts cattle at Brighton, Watertown, or Somerville.

In August, 1916, 1,931 milch cows went through Brighton stock yards, and of that number about 480 were native Massachusetts cattle or cattle that have been owned at least six months in this state.

Each year a physical examination of all cattle in the Commonwealth is made by the city and town inspectors, and if a contagious disease is suspected in any animal, that animal must be placed in quarantine, and a certified copy of the order sent to the Department of Animal Industry.

Subsequent to his report, an inspector, a veterinarian, or layman is sent to examine the animal in quarantine, and if, in his opinion, the animal is not diseased, said animal is released.

There appears in Public Document No. 98 the fact that 1,456 native cattle were suspected of tuberculosis by the inspectors—some inspectors are veterinarians—and of that number 194 were officially released.

It is recorded in Public Document No. 98 that 49 head of cattle were reported as reacting to the tuberculin test by veterinarians, and they were released as they could not be condemned on a physical examination by agents of the Department of Animal Industry.

To me it is paradoxical that one department of this state should permit the existence of centers of disease that carry contagion to man from diseased cows through milk, while another department should be under the great expense it is, being constantly supplied with patients and using all the energy at its command to *restore* the innocent victims to health.

The subject has an economic as well as a humanitarian phase, and should be kept under the spotlight of public opinion until remedied.

Since the duty of the Boards of Health is sanitation, and sanitation stands for prevention, can this organization do a greater service to the commonwealth than to have corrected and revised Section 31, Chapter 90, of the Revised Laws as amended by Chapter 322, Acts of 1903, thus aiding in the conservation of "The Common Health of the Commonwealth."

WHAT WE HAVE LEARNED FROM THE NEW YORK EPIDEMIC OF POLIOMYELITIS.

Dr. Charles F. Bolduan,
Director, Bureau of Public Education, Department of Health, New York City.

Read before the Annual Meeting of the Massachusetts Association of the Boards of Health, Holyoke, Mass., October 19, 1916.

THE title of this address is rather unfortunate and I think I shall, instead, give the results of my observations of the outbreak of poliomyelitis as it occurred in New York City.

The records of cases of this disease in New York aside from deaths begin in 1910 when the disease was first made reportable. In 1907, there was an extensive epidemic and it has lately been said that the Department of Health at that time had handled the cases without publicity, etc. What actually happened was that there was an extensive outbreak concerning which the Department of Health officially knew nothing until September and October, when the orthopedic surgeons began to find a large number of paralyzed children in their clinics. Studying back to find the cause of this, it was learned that an epidemic had taken place and we were able to reconstruct the history of an outbreak embracing about 2,500 cases. The disease was not made reportable until several years later.

The 1907 outbreak extended to Massachusetts and the Massachusetts State Board of Health did excellent work in studying the disease during 1907, 1908 and 1909. Since 1910, New York has had from 200 to 300 cases each year and in 1912 there were 500 cases, so we may say that the disease is always with us and the same is true of other places.

Concerning the present outbreak in New York attention was first called about the first week in June to a group of about eight or ten cases in a restricted area in Brooklyn, and while these were being investigated, a few more were added so that there were thirteen or fourteen cases in a dozen blocks. The Department of Health placed a nurse in each of these blocks to make a house to house canvass and in three days forty-five cases were revealed.

Two courses were open to the Department of Health; it could make a quiet investigation and see where it would lead. However, if it did this, it would not learn of all the cases and it was thought that if a warning was issued through the newspapers notifying people of the presence of the disease and asking them to be on the lookout, the department would be more apt to learn of new cases promptly and to isolate them and there might be some hope of controlling the spread of the contagion. Accordingly, a notice was issued asking everyone to notify the Department of suspicious cases of illness. As a result we received a great deal of valuable information. Much of it was anonymous, much of it came in by telephone. A diagnostician was sent to investigate each of these reports of suspicious cases and to determine whether or not it was infantile paralysis.

Up to date a total of 9,200 cases have been found. A great many were reported which proved not to be poliomyelitis. There were about 18,000 to 20,000 reports and about half have proved to be true cases. There is no doubt that publicity brings out the presence of cases of the disease. On the other hand, many of the people were alarmed and some became panic stricken and fled from the city. A quarantine against the children from New York City was established elsewhere and great trouble was caused to many New York City people.

Why does this disease become epidemic? This is the great question which has been unanswered up to date. Some think it may be due to peculiar weather conditions but a careful comparison of this with the condition of the weather in other years, furnishes no clue. It is interesting to note, especially in large cities, that the epidemic burns itself out in a given area. It invades a certain part of the community and burns out in the area of invasion in about four weeks, spreading at the periphery to new areas, but at the end of that time very few new cases are found on the site originally invaded. Why this happens we do not know. This disease certainly does not infect all children of susceptible age presumably exposed. There are 600,000 children under five years of age in New York City and only 8,000 were infected, or 1⅓ per cent.

The outbreak started in New York City on the water front in the Borough of Brooklyn then spread toward Bay Ridge and then to Brownsville sections of Brooklyn. We found apparently no relation between the disease and filth. From our standpoint of course, this is unfortunate, because we always like to work in a lesson on civic cleanliness. There were many cases in the better section of Brooklyn along Prospect Park. In Newark, N. J., I am told, it was decided early in the year to conduct a clean-up campaign. Not having sufficient funds available to apply it to the whole city, the authorities expended their energies in thoroughly cleaning up one ward. This ward, which was much cleaner than ever before, suffered the worst from the disease. However, a campaign for general cleanliness is never wasted for it always produces good results in the reduction of infant mortality.

In an epidemic of poliomyelitis, the question at once arises what to do with the persons afflicted. It was decided in New York to try quarantine and isolation and to remove all affected children to the isolation hospital unless there were ideal conditions at home. The health department's isolation hospital soon proved inadequate and other hospitals in the city had to be called upon until finally these cases were taken care of in twenty-seven hospitals besides our own. Not in a single instance did the disease spread in hospitals to other patients, nurses or doctors. Moreover, secondary infection was infrequent in families. This is remarkable considering the extent of the epidemic and the rapidity of its spread.

Another peculiarity of the disease is the fact that it was not most prevalent in the most congested parts of the city, but was more prevalent in Staten Island *i. e.*, among the suburban population where the ratio was 2.05 per thousand population. In Manhattan it was but .26 and in the Bronx but .24.

Our main interest, of course, centers in the manner in which the disease spreads. The researches of Flexner have shown the virus to be present in the nose and throat of patients. It is natural therefore to think that the disease is spread like cerebrospinal meningitis by direct contact with the nasal mucus as a vehicle of infection. But cerebrospinal meningitis and other diseases which spread in this way, have their greatest frequency in the winter and here is a disease which has its greatest frequency in the summer and resembles in this summer incidence typhoid fever and the diarrhœal diseases which are ordinarily contracted through uncleanly personal habits, foods, flies, etc. This point of summer prevalence is not, I think, sufficiently emphasized.

Personally I believe we ought to abandon the idea that this disease is spread by *direct* contact of person to person by the respiratory passages (coughing, sneezing, spitting, etc.) and to consider it more in the class of diarrhœal diseases and typhoid fever. In diarrhœa, investigations have shown that the disease runs hand in hand with flies and dirt. This may prove true of poliomyelitis.

Conceivably the disease may be spread by food alone. In this connection, milk comes to mind. In New York City, the milk situation was carefully studied and no connection was found between milk supply and the distribution of the infection. On the other hand, we may consider that milk is the vehicle in a secondary way, having become infected in the house or by handling. It is evident, however, that the infection is not primarily milk-borne in a way to be compared with typhoid fever, where in an outbreak all the cases occur on one milk route.

Finally, we come to the hypothesis of the spread of the disease by biting insects such as flies, mosquitoes, bedbugs, lice, etc. In the present outbreak some of these may at once be excluded. Many cases, for instance, were in houses where there were no bedbugs or lice. Flies are harder to exclude, but there is no evidence at the present time to connect them with the disease. Recently some United States Public Health Service investigators studying the New York City outbreak inclined to the theory that the disease was spread by rats in a manner similar to that obtaining in bubonic plague. While this theory at first looked promising it finally had to be abandoned like the others.

We often hear it stated that the most important lack in our knowledge of the disease is the identification of the normal carrier. It was found in Sweden that the nasal washings not only of the patients but of those in close contact with them, might contain the virus as shown by its ability to infect monkeys. Accordingly it has repeatedly been said that if we only could discover some simple way to discover normal carriers, the control of the disease would be easy. Well, we have known how to discover diphtheria carriers easily for many years, but that fact has not enabled us to eradicate the disease. We know how to identify typhoid carriers and it has only added to the difficulties of the typhoid problem. Ten per cent. of all normal individuals are carriers of the pneumococcus and that fact gives us no help in the control of pneumonia. So I may say that even though we had some ready means of recognizing normal carriers of poliomyelitis, we would not be much nearer to the control of the disease.

The next question that arises is—"How much good has been accomplished by quarantine and isolation measures." Speaking unofficially and personally, I believe it has helped very little indeed. It is certain that quarantine is very irksome, especially in a large city, and even with our best efforts it is not a real quarantine. It is conceivable that a real quarantine might possibly control the disease, that is if no one were allowed to pass in or out of a particular infected house, not even the wage earner. Even that, however, is by no means certain. In New York, as you know, many of our tenement houses shelter twenty families and where a case occurs in a family we just quarantine the one apartment, not the whole building. So you see this is not much of a fence around the virus and if the disease is carried by flies, by food or by carriers, not much good is accomplished. However, this was the best we could do; as a real quarantine would not be tolerated. Some small communities have tried a real quarantine and yet the disease has spread. To my mind the fact that the disease does not spread in hospitals seems effectively to rule out the theory that it is carried by direct contact.

I have just noticed in the newspapers the statement attributed to Rosenow. He believes that we are on the wrong track ascribing the disease wholly to a filterable virus. He believed that the cause is a much larger organism, of which minute forms present pass through the filter, the greater part of the infectious matter, however, being held back. Rosenow has been able with the organism which he isolated to give typical paralysis to small animals. A definite connection between these paralyses and those due to infantile paralysis has not yet been proven. We must, however, do this before we can rule out the theory of a filterable virus.

One most attractive suggestion is that in this disease we are dealing with a very common affliction which only at times takes on a paralytic form. According to this theory the disease usually occurs as an ordinary gastrointestinal disturbance like summer diarrhœa but at certain times and for reasons unknown it appears in a large proportion of cases in a paralytic form. There is no way at present to prove or disprove this theory.

One remarkable thing in connection with the present New York outbreak is its high virulence, as indicated by a mortality of 27 per cent. It is also most interesting to note that this mortality started at 22 per cent. and ran up to 28 per cent. or 29 per cent. in the latter part of the epidemic, showing an increase in virulence as the infection passed through the community, similar to that shown in other organisms in laboratory experiments. Hand in hand with this increased virulence the age of those affected also rose slightly and the infection was found more commonly among older children. Altogether, though, 85 per cent. of the cases were in children under six years of age.

One important lesson should be noted. We have found, despite the enormous number of deaths from poliomyelitis, that the general death-rate is lower this year than last year especially in the deaths of children from diarrhœal diseases. You may smile and say that doubtless many deaths from diarrhœa have been reported as poliomyelitis. There is, of course, some possibility of truth in this but all fatal cases have been carefully investigated by one of our best clinicians. In each case he conferred with the attending physician and carefully went over the symptoms. It was found that in almost all the fatal cases, death was due to respiratory paralysis. We are convinced that errors in diagnosis can only account for a very small part of the saving in deaths from diarrhoeal diseases.

I think the main credit for this excellent showing in the general death-rate belongs to health education. We carried on our educational effort through newspapers, bulletins and lectures, advising the people to clean up, to watch over their own children, and to be careful about the food. The public was aroused and took heed. To my mind, then, the most important lesson learned from the epidemic is that publicity of this kind is extremely profitable for it lowers the death-rate of the community.

Discussion.

Mr. W. W. Porter, Westfield: I would like to ask Doctor Bolduan how much foundation there is for the report that the organism causing the disease has been discovered at Johns Hopkins.

Dr. Bolduan: I understand this report is all newspaper talk and that no discovery of the kind has been made at Johns Hopkins.

Mr. W. H. Brock, Athol: In Athol with 10,000 people there were four cases of poliomyelitis and the schools were closed. Personally I believe the schools have no part in the spread of the disease still I know they couldn't open the schools in New York City and that public opinion must be taken into account.

Dr. Cavanaugh, Holyoke: I would like to ask in what per cent. of the New York cases there was more than one case in a family.

Dr. Bolduan: There was 1 case in a family in 6,521 instances or 96.63 per cent.; there were 2 cases in a family in 205 instances or 3 per cent.; there were 3 cases in a family in 20 instances or .3 per cent.; there were 4 cases in a family in 1 instance; there were 5 cases in a family in 1 instance.

Mr. Porter: Was there a time interval between cases where more than one occurred in a family?

Dr. Bolduan: That has not been worked out but it is known that some of the cases were simultaneous so the actual percentage is less than three.

Dr. Denny, Brookline: I noticed in the newspapers a statement that those who drank the Straus pasteurized milk were not affected. Was that the fact?

Dr. Bolduan: This statement does not agree with our knowledge of the facts, and the Commissioner so informed Mr. Straus. A cursory investigation showed three or four cases in the hospital among those who used the Straus milk exclusively

Dr. Morse, Somerville: I would like to ask how much benefit it was to those going back to New York City to have a certificate from the local health department.

Dr. Bolduan: If the child returning to New York does not bring such a certificate he is kept out of school for two weeks. If he has the certificate he can go right into school.

Dr. Dionne, Ware: I have been very interested in the able contributions with which we have been gratified here today and I rise, as representative of the Ware Board of Health, to express my appreciation thereof.

I must confess my disappointment at not hearing the paper on quarantine hysteria, for, as medical advisor of my board, I have been accused of suffering from that disease and I was well disposed to demand a treatment for it before I left this hall. Only a few days ago, a friend of mine, a surgeon of very good attainment, attempted to spar me by saying that when he came to Ware and read the notices of our regulations regarding poliomyelitis, he held his breath for fear of contracting the disease, and he ended his genial sarcasm by saying "with due regard to the Ware Board of Health, poliomyelitis is not a communicable disease." Notwithstanding that *Ipse dixit*, I retorted that it would be more logical for him to hold his breath while in his own city where they did not half quarantine the disease, and when I got through with him I believe he had concluded that when he came to Ware again it would be safe for him to breathe freely and safer still to hold his tongue for I stand antagonist to any man who will come and say: poliomyelitis is not this, it is not that, unless such a man is competent to tell me what it is and how to control it.

What I have heard today confirms me in the belief that though we may still be purblind as to the *nexus* of communication of acute infectious paralysis—this is my name for it and I am glad to notice that the speaker did not allude to it as infantile paralysis, for that, in my opinion, is a misnomer—Then I say that we know enough to lead us on to a greater efficiency as to its prevention, its control and after-treatment. We know that experimentally it is a communicable disease and because it does not strike every member of a family in which it is present, are we going to conclude that clinically it is not contagious?

Do we look for such a broad sweep in other contagious diseases? Have we not seen single cases of measles, scarlet fever, diphtheria and smallpox in large families with unrestricted promiscuousness? I fail to see wherein poliomyelitis differs very much, in its behaviour, from the whole gamut of epidemic diseases. It comes in under favorable circumstances, it courts predisposition and evolves upon the *locus minoris resistanciae* whether that is found in childhood or adult life. Granted a case of acute infectious paralysis, what are we to do to control it? I say, do anything that is consistent with our knowledge of other epidemic diseases, strict isolation being the first condition to secure. I noticed that a moment ago, when the speaker said that he could not say that quarantine had done any good in New York, a number of people in this audience laughed as if they had scored one point against the Board of Health. I also note that Doctor Bolduan conceded that isolation had not been complete because the people would not let them enforce it. That is enough to raise a question and before we venture into hasty conclusions, I submit, gentlemen, that it were better to let New York manage another epidemic, without any quarantine, and see where they may land. The isolation of the diseased lamb is a prescription, older than the Bible and it stands today as the fundamental principle of prophylactic medicine.

After making a killing and crippling levy in New York, the scourge has taken an inroad in Massachusetts and other states and it is obvious that we Boards of Health must awaken to our fullest sense of responsibility and face the situation intelligently and resolutely. By constitution, we are the custodians of all the health laws of the commonwealth and it behooves us to see to it that they are fulfilled not only to the letter but to their true spirit.

The question of the tuberculous cow has been discussed here today, we know of the danger of this public nuisance and yet, I charge that herds of cattle escape inspection, year after year.

We know that through our national system of public education, the children of the most benighted individuals are placed side by side, arms in arms with our children in the schools and that unless we force those people to a higher standard of sanitation they will drag us down to their own. Section 1, of Revised Laws 42 says: Public schools shall give instructions in hygiene and physiology and the section prescribes the manner in which such instructions shall be given. I charge, that in a large number of schools, that mandate is absolutely disregarded and I contend that in all of them hygiene should be placed on the same footing as music. At last, let me tell you what our board did to prevent poliomyelitis in Ware. On the 19 th of August, our inspectors were called in and they were directed to visit the markets, the groceries, the bakeries and the fruit stores and make sure that our rules were carried out. On that same day, we closed the theaters to all persons under 14. We closed the swimming-pool, though our town had appropriated $3,500 to create it. I believe that a swimming pool without sanitation is a most ready scource of infection. We prohibited the conveyance of children in and out of Ware and now as to results, you may call it coincidence if you please, you may heap hypothesis upon hypothesis but you will have to concede that there is nothing so brutal as fact and it is a fact that while acute infectious paralysis loomed up all around us and was fatal in Monson and Palmer, to this hour, we have been free from it in Ware and that fact alone is sufficient to uphold our attitude in the matter.

Dr. Hurley, Holyoke: A health survey of Holyoke showed that there were sixty families there from New York City and that the outbreak followed the visits of New York families. The first case was from New York City.

Dr. Henderson, Holyoke: I would like to ask as to the value of treatment, especially in relation to the use of immune serum.

Dr. Bolduan: It is difficult to guage the value of any form of treatment because a large per cent. of untreated cases do very well. We have tried treating a certain number of cases by injection of immune serum from the blood of one who had the disease. Others were injected with serum from a normal adult. We did this for two reasons: First, it may be a common disease that every one has and the blood of adults may contain immune substances and second as a control. Then we treated a third group by withdrawing spinal fluid and injecting normal horse serum. Another group by withdrawing spinal fluid and no injection, and finally some were treated by withdrawing spinal fluid and the injection of adrenaline.

Later, when there has been time for observation and comparative study of the five groups we may be able to give a definite answer to the question, but not now.

Dr. McCabe, Holyoke: In our city quarantine breakers moved to other houses four times and in each instance cases followed in the house they moved to. Was this contact or coincidence?

Dr. Bolduan: Such a thing happening four times shows connection but not the mode of transmission. The focus is undoubted but the manner in which the contagion is carried is questionable. There is considerable evidence to show it is not direct contact.

Dr. McCabe: If we had been able to keep the members of those four families in their own houses would we have prevented the four succeeding cases?

Dr. Bolduan: Perhaps. We used to face about the same problem with yellow fever. Even if quarantine were strictly maintained we are not absolutely certain the disease would not break out. There have been a number of instances where rigid quarantine has been enforced and still the disease has broken out elsewhere.

Dr. Hurley: Isn't it true that at Bedloe's Island and Governor's Island where there is no travel there are no cases?

Dr. Bolduan: There are few children on the islands and we must remember that even among susceptible children not over a very small percentage are attacked.

Book Review.

Personal Health. A Doctor Book for Discriminating People. *William Brady, M. D. Pp. 407. Philadelphia: W. B. Saunders Company. 1916. Cloth, $1.50 net.*

The popular interest which is being taken in public health as well as personal hygiene is indicated by the crop of books which are appearing written for the laity. It is an encouraging sign. One of the newest of these is the book under consideration, and it is not too much to say that it is one of the best. The range of subjects is broad, covering almost everything which the average person needs to know. One peculiar omission is an adequate treatment of baths and bathing. Only two and a half lines are given to this topic, in speaking of high blood pressure.

In the preface the writer calls attention to his correspondence with thousands of readers of popular "Health Talks" throughout the country as having shown him the errors and misapprehensions which are common among the laity, and with these in view he has written this admirable book. There is scarcely a subject on which the layman is liable to need information which cannot be found in this book, although it is well within the limits of size for comfortable and easy reading.

The writer has a very pleasing way of putting facts. The book is readable. One who takes it up is apt to continue reading, in spite of the frequent change of subject which is necessary. The characteristics of the book which stand out are common-sense and a strong stand against fads and quackery. The tone of the book is high.

The author has an unusual facility for putting things in a striking manner. The writer of epigrams will necessarily exaggerate at times in order to make a striking statement. Nevertheless, epigrams are pointed and are remembered. Some of those given in this book are worthy of wide quotation and perpetuation. For example, "All is not 'cold' that shivers, but pretty nearly everything is catching that snuffles." " 'Taking cold' is no joke. It is a very vicious delusion." His illustration of the free and promiscuous use of saliva is very striking. "If saliva stained things blue, what a blue world this would be. . . . The world would be a study in blue. Door knobs, handles, street car straps, window ledges, magazines and books in libraries, doctors' offices, and private homes would all have blue covers. There is no limit to the common exchange of saliva."

It seems curious that the author of a book which is replete with good things and marked by so much common-sense should in this day and generation cast doubt on the existence of rabies in man, based largely on his own experience. If all took such ground we might deny the existence of a good many well-known diseases.

A chapter, entitled "Notes on Miscellaneous Major and Minor Maladies", is devoted to short descriptions of the important diseases and conditions which are ordinarily met with.

An appendix, consisting of about ten pages, gives some useful prescriptions. The reviewer feels that the book is open to criticism on account of the number of prescriptions throughout. It must be said, however, that there is no attempt to make "every man his own physician," and that the prescriptions which are given are almost all of the simplest kind, and for the most part will serve to deter persons from buying patent medicines, or drugstore counter prescribing. To this extent they are to be commended.

Taking it as a whole, the book can be thoroughly recommended to all laymen who are interested in the matters treated. Wide reading of such books cannot but bring about a better understanding of disease and health, and be productive of good. The book is well printed in clear type and on unglazed paper.

Mazyck P. Ravenel, M. D.

Health Department Reports and Notes.

REPORTS.

Newark, New Jersey.

It is rather unfortunate that the cities throughout the country do not have anniversaries of their foundation more frequently, for if such were the case citizens would undoubtedly become more familiar with the ideals, the work, and the difficulties attached to the work of their health departments. This point is brought most forcibly to our mind by the receipt of the attractively bound, and carefully and well planned 1915 Annual Report of the Department of Health of Newark. It is obvious that the spirit of the celebration of their 250th anniversary has infected all departments of the city, and one of the fruits of this spirit is Dr. Craster's most creditable report, which by virtue of its style alone should reach persons never before interested.

Newark appropriately reports the lowest death-rate in its history, a rate of 14.3 per 1,000 population, which represents a comparatively steady decrease since 1894, when the rate recorded was 22.28. All statistics have been based on the accepted population of 375,000.

The deaths during 1915 from the epidemic diseases of children show considerable decreases over those recorded in past years, with the exception of whooping-cough. The mortality from typhoid fever, numbering eleven deaths during the year, is the lowest in the history of the records and indicates the improved sanitation of this city.

The infant mortality rate was also the lowest reported in Newark's history, a rate of 85.3 per 1,000 births. In 1915 the deaths under 1 year were 16.8 per cent of the total deaths of the city, while in 1914 they were 19.8 per cent. In connection with deaths of infants under one month, it is surprising to note that the infant mortality rate is more than twice as high among those delivered in hospitals than those delivered by midwives, and 50 per cent. higher among those delivered by physicians than those delivered by midwives. Naturally these differences are greatly discounted when one considers the nature of the case and the type of mothers, but even after correcting for this it is pointed out that death-rate of infants, particularly under one month of age, is considerably lower among those attended by midwives than those attended by hospitals and physicians. The infant death-rate was further diminished by infant welfare work accomplished among the foreign population. Education work has become the basic principle of prevention in child hygiene work. Such education is accomplished by teachers who by frequent visits have come into intimate, personal and friendly contact in the homes. Leaflets on "prenatal care," "summer care," and "winter care" have been issued in four languages. Consultation Stations and Little Mothers' Leagues have been established. A census of 888 mothers under the care of this division showed that only twelve babies under six months of age were on the bottle, or less than 1.3 per cent. This large proportion of babies nursing at six months has been accomplished, it is felt, by the accumulative effect of educational propaganda for maternal nursing upon the mothers. Contrary to the tendency of most cities, at the present time this city is attempting to raise the standard of midwifery, rather than attempting to eliminate it. An example of the efficiency of the work of the infant hygiene bureau is the fact that the death-rate among babies supervised by this bureau is 10.3.

During the year there were reported 2,146 cases of tuberculosis of all forms, with 808 deaths. The control and prevention of this disease seems to be Newark's most demanding problem. The Bureau of Tuberculosis under the able direction of Dr. Thomas N. Gray, who is convinced that tuberculosis has among the chief underlying causes poverty and bad housing, has been most active and has carried out its work in a very commendable way. Improvement in the city's tuberculosis condition is looked forward to with the establishment of local clinics and the more rigid enforcement of the State Tenement House Law and ordinances of the Board of Health.

Much attention has been paid to the maintenance of good sanitary conditions throughout the city. Some 40,000 inspections were made during the year, most of which were original inspections. Excellent results were obtained in anti-fly and mosquito work and in the improvement of insanitary housing conditions. Monthly instructive lectures to the sanitary inspectors were inaugurated. The daily amount of milk delivered into Newark averages 135,000 quarts. Of the 2,238 samples examined during the year, 68.9 per cent. showed bacteria in the raw milk under 100,000 per cc. Two large pasteurizing plants are being completed within the city, and as a consequence much of the milk from the outside will be pasteurized and bottled in the city under absolute supervision by the health department.

Newark has a total health expenditure of $191,400, or about 51 cents per capita. It has become most pertinent for health departments to distribute their appropriation among the several fields of health work, so that they may obtain the best return for the money expended. Franz Schneider, Jr.,* of the Russell Sage Foundation, has recently arbitrarily assigned values to the various fields of health work, based on the several necessary criteria. He assigned to the control of communicable diseases, including tuberculosis, the greatest value; infant hygiene work was assigned the second greatest value; sanitary inspection was not assigned as great a value as the value the vast majority of city health departments seem to attribute to it. If we accept Mr. Schneider's values, and there seems to be no valid reasons why we should not, a study of this city's expenditures appear open to improvement. The expenditures of the bureaus of plumbing and child hygiene are approximately the same, namely about $10,300, while the division of disinfection spends nearly $13,000, and the sanitary division spends $41,500, scarcely less than that expended for the control of communicable diseases, including the maintenance of the tuberculosis sanatorium. While this may not seem a just criticism at the present day, it is certain that within a few years, this question of relative values of health activity must be considered by the health departments, and even today in several instances this phase of health administration has received consideration.

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* Relative Values in Public Health Work, Franz Schneider, Jr. AMER. JOUR. OF PUBLIC HEALTH, September, 1916.

Illinois Society for the Prevention of Blindness.

Organized effort in the State of Illinois to prevent needless blindness was inaugurated when the above society took offices in Chicago on March 1, 1916. The society is really an outgrowth of the organization formerly known as the Illinois Association for the Conservation of Vision and Prevention of Blindness, which carried on its work for several years in an informal manner by a group of volunteers. Early in the spring of 1915, Mr. Bryan Lathrop accepted the presidency of this Association, and in the spring of 1916, Miss Carolyn Van Blarcom, formerly executive secretary of the New York State Committee for the Prevention of Blindness, was chosen as full-time secretary, to organize and develop a state-wide movement for the prevention of blindness.

And now, after eight months of splendidly active work, the Society has issued its First Report, March 1 to October 31.

The initial work of the Society was the eradication of babies' sore eyes, since it was recognized that this disease was the most prolific cause of needless blindness. To accomplish this end an effort was made to secure a more general observation of the law pertaining to the reporting of all cases of babies' sore eyes, and to give wide publicity to the importance of caring for such sore eyes. Thirty-two violations of this law were discovered, and a number of convictions have been handed down. The value of such prosecutions has already been demonstrated in the amazing increase in the number of cases of babies' sore eyes being reported to the health authorities. From May 1 to October 31, 1915, only 19 cases were reported, and for the same period in 1916, 86 cases were reported.

The Society was enabled to follow up each case reported to see that adequate measures were being applied, and in none of these cases did blindness result. Active coöperation along this line exists between the Chicago Department of Health, the physicians and the Society. In fact more cases have been referred to the Society than its present staff can properly handle, which fact clearly demonstrates the need of extensive work along these lines. The certain amount of apathy, ignorance, and prejudice among the mothers, encountered by the Society in its work even among the comparatively few cases treated, clearly indicates the absolute necessity of wide publicity and education of the people in this phase of infant hygiene. A number of such extreme cases are cited in this report. In five such instances it was necessary to swear out warrants for both parents to protect the baby against its parents. In one case cited, after several hours of persuasive arguments, the only thing that won the parents over was the offer of a taxi ride to the hospital.

The saving to the state, for which the Society so far is directly responsible, has been estimated at $50,000. The real saving to the state, it is felt, both of money and citizens, will follow in the wake of widespread and sustained publicity, and it is upon this foundation apparently that "all the work for the prevention of blindness must rest, whether babies, children or adults are to be helped." The early efforts have not alone been confined to babies, but in several cases children and adults have been assisted.

It is planned to carry on the publicity through the distribution of illustrated leaflets, printed in several languages; by lectures and addresses; by the use of lantern slides and photographic exhibits; by the aid of the press, and coöperation of the doctors and nurses and social workers.

The Society's first educational pamphlet is entitled "Directions for the Prevention of Blindness from Babies' Sore Eyes," printed in six languages. Thirty thousand issues of this have been distributed in Illinois, and it has been adopted by similar societies in New Jersey and North Carolina. Throughout the entire campaign the Society has been fortunate enough to have encountered splendid coöperaton both from lay and semi-medical and medical organizations, from the press and from a number of national publications, as is worthy of such a movement.

As in all movements of this nature, the full benefit of the work cannot be estimated, at least mmediately, yet the results of only eight months' work as set forth in this report will point out the enormous benefit that is to be derived in future years by the state and even by the nation. The Society is, moreover, most fortunate in having secured Miss Van Blarcom as its secretary, who brought to it, in addition to her experience, her inherent energy and initiative, and her most fortunate gift for securing enthusiastic coöperation. And, too, it is true that this Society, as well as all similar agencies, should receive the sincere support of the many people, no matter in what way they may serve, who are concerned with the public health.

In closing the report, the following purposes of the Society are presented:

1—To work for the complete eradication of that scourge known as babies' sore eyes by employment of the methods previously described.

2—To work for the training, licensure and control of midwives by state authority. (It is in great measure due to the ignorance and neglect on the part of these women that many babies go blind.)

3—To aid in the conservation of the eyesight of school children by securing for all schools thorough medical inspection, adequate lighting, lusterless blackboards and desk tops, provision for furnishing eye glasses at little or no cost to indigent children and special classes for children with seriously impaired vision.

4—To coöperate with the United States Public Health Service in fighting trachoma throughout the state.

5—To strive for better lighting conditions generally in public buildings and conveyances, in schools, factories and the home, and to do away with the causes of eye strain so far as possible.

6—To promote the safeguarding of eyesight in the industries by more general use of protective devices such as goggles, guards, screens, etc., and adequate lighting.

7—To try to put an end to the misuse of wood alcohol, a poison which may cause blindness or death if swallowed or inhaled in an inadequately ventilated place.

Wood alcohol in any form or container should be labeled poison and its use forbidden in beverages, medicines and toilet preparations.

NOTES.

Blood Test as a Condition for a License to Sell Milk.—Justice Rodenbeck of the New York Supreme Court recently handed down a most instructive and interesting decision relative to the reasonableness of a requirement, in Rochester, N. Y., of the blood test as a condition for a license to sell milk. Believing this to be of interest to readers of the JOURNAL we are reproducing below through the courtesy of the New York City Department of Health, the full text of the decision from that city's *Weekly Bulletin* for December 23:

1. *Constitutional Law—Regulations—Power to Make.*—The state may make such reasonable regulations as it deems necessary to protect and preserve the public health, and may delegate that power to local authorities.

2. *Food—Regulations—Power to Make.*—The charter of the city of Rochester (Laws 1907, c. 755) and the existing ordinance of the city relating to the sale of milk empower the commissioner of public safety to impose reasonable restrictions in the interest of public health as a condition of obtaining a license to sell milk and cream in the city, and authorize him to devolve upon the health officer the administrative duty of seeing that the requirements are given effect.

3. *Food—Regulations—Power to Make.*—This power is not in conflict with the general statutes of the state, or with the State Sanitary Code, both of which reserve in the city the power to make reasonable regulations relating to the public health of the people of the city, not inconsistent with such general statutes or regulations.

4. *Municipal Corporations—Police Regulations—Delegation of Powers.*—The common council has not attempted to delegate its function with respect to the conditions under which a license to sell milk and cream may be sold by authorizing the health bureau to issue the license, but reserved in the commissioner of public safety the power to impose reasonable conditions; nor has the commissioner of public safety in this instance delegated any of his discretionary power to the health officer.

5. *Municipal Corporations. Officers—Health Department—Duties.*—The health authorities of the city are not required to wait until an epidemic of typhoid has broken out before taking precautions against it, but in the exercise of a reasonable judgment may anticipate such a condition, and may and should make all reasonable efforts to perform the duty imposed upon them by statute, and to take all reasonable precautions to protect the public health before the emergency arises.

6. *Health—Regulations—Determination of Necessity.*—The degree of precautions necessary to protect and preserve the public health under normal conditions, in the absence of an emergency calling for extraordinary measures, is to be determined by circumstances, and each requirement must be passed upon in the light of the circumstances and conditions existing at the time of its adoption.

7. *Food—Health Department—Validity of Regulations.*—The requirement of a blood test as a condition for a license to sell milk in the city is a reasonable condition, since it imposes no serious inconvenience upon the applicant, and it is a matter of common belief that typhoid is a contagious disease, and that such a test will reveal whether or not the person whose blood is examined has had typhoid and is a carrier of typhoid, and the transmission of this disease may thus be avoided by suitable precautions.

8. *Food—Health Department—Reasonableness of Regulation.*—The requirement of a blood test as one of the conditions for a license, among others, is one resting in the sound discretion and good judgment of the commissioner of public safety, in the absence of an ordinance of the common council limiting his authority, and is not subject to review by the courts, where the requirement appeals to the courts as reasonable and just, necessary to protect the public health, and neither capricious, arbitrary or unjust.

⁂

Overcrowded Cars a Health Menace.—"The conditions of traffic in New York City have for many years been a matter of grave concern to the entire body of citizens," states the December 23 *Weekly Bulletin* of the Department of Health of New York City, and in no small degree is the annual winter increase in certain types of disease attributed to serious and insanitary overcrowding of traffic conveyances. In fact the Department of Health of that city is in position to prove that "the increase in virulent, infectious bacteria in the air in the cars is in proportion to the degree of human overcrowding."

Two years ago an effort, instituted by then commissioner of health, Dr. S. S. Goldwater, was made to remove, or at least minimize, this menace, the order issued forbidding cars on certain car lines to carry a number exceeding one and one-half times the seating capacity of said car. The application of this order, while partially effective, aroused considerable adverse criticism, since it created considerable hardship for the traveling public, in that large numbers continually encountered great difficulty in being able to ride.

The public had to be satisfied, also the health menace had to be reduced to the minimum. As a consequence a meeting of the Advisory Committee on Traffic Sanitation was held to determine the best policy for the Department of Health to adopt on December 15, 1916.

After considerable discussion, it was decided that overcrowding could be eliminated to a great degree if the full track capacity of all lines was used, as far as practicable, to meet the demands of the public. It was agreed that when the operating companies were using to the full all the available facilities which the public allows them, it would be unreasonable to demand that they exclude excess passengers from their cars. The committee further recommended that the Board of Health revoke the existing orders, mentioned above, and to add the following section to the Sanitary Code:

"Sec. 306. *Cars not to be overcrowded.*—The carrying of passengers on railroad cars in the city of New York shall be so regulated at all times that the number of passengers on any such car at any time shall not exceed one and one-half times the seating capacity of the car; provided, however, that the foregoing provisions of this section shall not apply when the full number of cars which shall have been ordered by the Public Service Commission to be operated on any line or part of a line are so operated; and provided, further, that the foregoing provisions of this section shall not apply, in the absence of such an order of the Public Service Commission, when the maximum number of cars which can be practicably operated on any line or part of a line are so operated."

This recommendation was submitted to the Board of Health, and on December 16 the existing orders were revoked, and the above cited section, Section 306, was adopted as a part of the Sanitary Code, to take effect immediately.

*

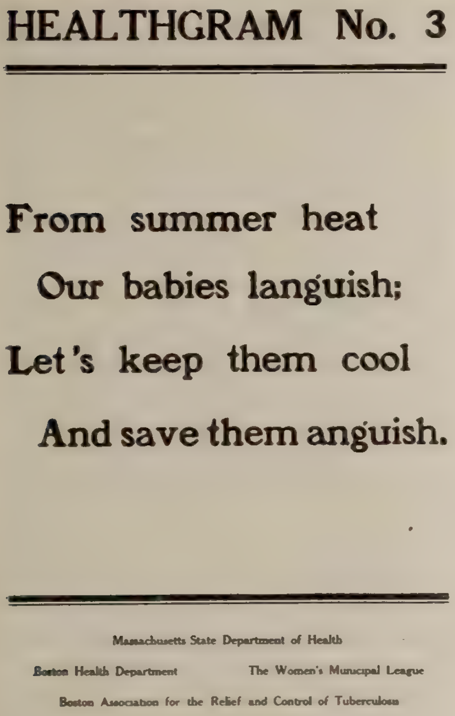
A Poster Campaign.—We reproduce in our columns three health grams which have been issued in Boston and vicinity by a special committee made up of representatives of the Massachusetts State Health Department, the Boston Health Department, The Women's Municipal League, and the Boston Association for the Relief and Control of Tuberculosis. These healthgrams are printed on heavy cardboard, 22"x 14", and are displayed in railroad stations, subway stations, department stores, and other places frequented by large numbers of people. So far seven healthgrams have been issued. The edition is 350 of each card, and the cost $14 per edition. The cards are put up in the subway stations by the Boston Elevated Company; in the railroad stations and lodging houses

HEALTHGRAM No. 2

The fly is crafty
and alert;
He carries germs
and also dirt.

KILL HIM!

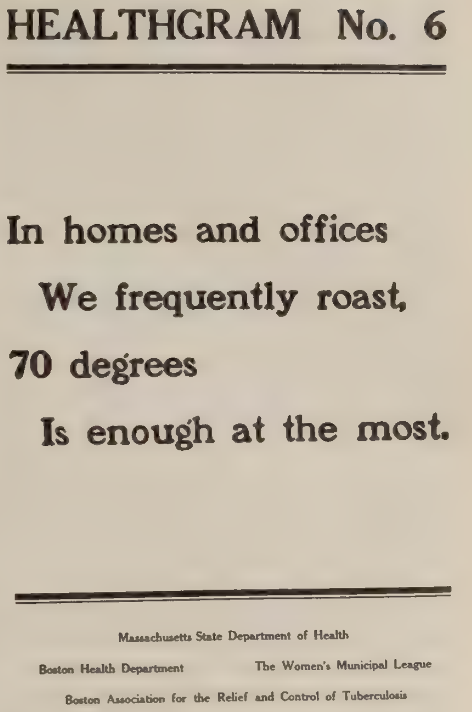
Massachusetts State Department of Health
Boston Health Department The Women's Municipal League
Boston Association for the Relief and Control of Tuberculosis



HEALTHGRAM No. 3

From summer heat
Our babies languish;
Let's keep them cool
And save them anguish.

Massachusetts State Department of Health
Boston Health Department
The Women's Municipal League
Boston Association for the Relief and Control of Tuberculosis



HEALTHGRAM No. 6

In homes and offices
We frequently roast,
70 degrees
Is enough at the most.

Massachusetts State Department of Health
Boston Health Department
The Women's Municipal League
Boston Association for the Relief and Control of Tuberculosis

by inspectors of the Boston Health Department; and in the stores by the Boy Scouts. So far all of the healthgrams have been in verse, as the committee feels that a short jingle is more apt to be remembered than a statement in prose. Approval of this campaign has been general. Health workers have a commodity to dispose of in the form of better health, and the use of posters seems to be a step in the right direction. An important feature is the fact that a large number of people can be reached at a very small cost.

*

Health Board Changes Recommended.—The commission named by the governor to propose legislation on public health, in Minnesota, of which Dean E. P. Lyon of the University of Minnesota Medical School is chairman, has made the following recommendations: that the state board of health be reorganized with five instead of nine members; be given broad general powers instead of specifying in detail in the law the limit of its duties and activities; should be empowered to appoint a commissioner of public health; should be assigned the functions of the advisory committee on tuberculosis sanatoriums, discontinuance of which is recommended, to be performed by a new division under a man specially trained in tuberculosis work; the transfer from the state department of labor of duties in connection with industrial hygiene; should be delegated organization of all existing state finance activities relating to public health and should be provided with large appropriations. Limitations of the general powers of the board are declared to be dangerous in the changing and sometimes emergency conditions arising in public health administration. In the selection of a commissioner the country should be searched and a man trained in sanitary science and public health administration chosen after a critical analysis of all candidates, and after the right man is found, the salary necessary to secure him should be paid. Other recommendations are made and discussed in the report.—*Journal of the American Medical Association.*

Modification of Rules for Release of Typhoid Patients.—According to the December *Quarterly Bulletin* of the Vermont State Board of Health the rule by which typhoid fever patients are released from quarantine only on negative examination of feces has been suspended. This was brought about by the fact that extensive laboratory work has shown that examinations of feces and urine from convalescent typhoid patients are often negative owing to the intermittent excretion of bacteria, and consequently cannot be called a direct proof of the absence of the disease. Consequently, hereafter, instead of sending in urine and feces for examination for bacteria, the patients are to be warned that they might become chronic typhoid "carriers" and that they should always exercise the utmost care in cleansing the hands before having anything to do with food supplies. The health officer will be responsible to see that the patient is thoroughly instructed before going back to his occupation.

*

Difficulties of the Connecticut State Board of Health.—At the first meeting of the recently organized Connecticut Public Health Association, appropriately enough, the secretary of the State Board of Health presented a status of that board to the persons in attendance. It had been felt that the people believed the board to have unlimited powers and to be well equipped in funds, but both of these beliefs are contrary to fact. Both the hands of authority and finance are tied. According to the *Monthly Bulletin* of the Board:

"The Board has the authority to *request* information concerning diseases prejudicial to public health but cannot institute an investigation nor introduce measures for control. Local health officers can be advised but not assisted. Indifference or neglect of duty may be noted but cannot be corrected. Provision has been made for the study of water and sewerage works without the power to regulate. The statutes require the dissemination of information on health subjects without providing funds for the purpose. Vital statistics which should be available within a few weeks cannot be tabulated for over a year because of restrictions imposed."

And to glance at the finances, the appropriation for the fiscal year is $24,000, or just two cents a year per capita. The average per capita expenditure for the rest of New England for state work is five and one-half cents. This is an effective comparison and well shows the necessity of concerted and statewide action for increased appropriation and greater authority.

And within the State, a comparison of expenditures for various activities is most dubious from the standpoint of public health, for the State spending annually, $250,000 on highways, $200,000 to care for the tuberculous, $56,000 to guard insurance interests, $37,000 to protect cattle, $46,000 for fish and game, and yet only $24,000 to preserve the health of its people.

An effort is now being made to reorganize the health system of the state and to place it on a firm financial basis, and with the organization of the Connecticut Public Health Association and its resultant activity this should receive the hearty endorsement of all people throughout he state.

*

Chicago's Diet Squad.—Chicago's Diet Squad Experiment, conducted under the auspices of the commissioner of health, for the purpose of demonstrating the possibilities of furnishing a daily bill of fare of pronounced nutritive value at a cost of forty cents per capita per day or less, has shown some interesting and, it is believed, valuable results. These results are described in the December 23 *Bulletin* of the Department of Health. First, it has shown that the actual cost of food served was materially less than that set at the beginning of the test, averaging thirty-one cents per person per diem. This cost does not include of course any overhead charges, as fuel, light, etc. Supplies were, moreover, bought at retail stores at prices which probably prevail in the resident districts throughout the city, and these supplies were purchased in the same way that any housewife would do her own table marketing. The *Bulletin* contains the menus for the three meals a day for fourteen days, which well shows the variety as well as the quality of the food prepared. Recipes are also included, and, indeed, this bulletin might well serve as one of those numerous cook books that every housewife has. The squad, as a whole, gained during the experiment 45.75 pounds or an average gain per person of 3.8 pounds. The main points brought out are that much of the high cost of living, or particularly of eating, is due to carelessness of purchasing and planning meals; furthermore the use of less expensive foods is entirely satisfactory when they are properly prepared and served. In conclusion the bulletin states:

"In fine, the experiment just closed has served only to open the door for the broader and more comprehensive investigations that are to follow; and to enable both experts and laymen to study the problem of food supply and preparation from every possible angle. It is believed too that the interest aroused by this experiment will not subside in a moment; that the people of this country will continue their studies; that they will seek more light and that they will gain more light on the problems which have been suggested at least by the Chicago Diet Squad Experiment."

Public Health Notes.

Traditional Fallacies about Tuberculosis.—"I believe I am not exaggerating when I state that medical literature, more than the literature of any other subject which lays claim to scientific accuracy, is apt to contain fallacies based on the assumption that, because of concomitance of time and place, two or more phenomena are caused by the same forces. Indeed, I would not be astonished to read in a medical paper or book that, inasmuch as during the past fifteen years motor cars have been increasing in number, and concomitantly poliomyelitis has been prevalent, there must be a causal relation between the two phenomena. Tuberculosis, being the most widespread of serious diseases, is burdened with many more fallacies of this character than any other morbid process, perhaps because it has been treated more as a social malady than as a pathological phenomenon, and the social workers have taken a hand in the attempts at its control."

With this introduction, Dr. Maurice Fishberg, clinical professor of medicine at University and Bellevue Hospital Medical College, New York, proceeds to attack what he terms "traditional fallacies about tuberculosis." (*N. Y. Med. Jour.*, Dec. 2, 1916.)

In opposition to the fallacies, he emphasizes the following points:

1. "When we speak of tuberculosis, we must always draw a sharp line of distinction between *infection* with tubercle bacilli, and *disease* which disables the victim, requires careful treatment, and perhaps kills.

"It appears that infection alone is, as a rule, powerless to produce consumption; there must also be an organism which is peculiarly predisposed; though we are still in the dark as to the nature of this predisposition."

2. Infection takes place only once. This practically always takes place in childhood, and as in other diseases immunizes against re-infection.

3. Inasmuch as adults cannot be re-infected, the strenuous prophylactic measures of health authorities, aimed at prevention of tuberculous disease in adults, are unnecessary.

4. Patients of tuberculous ancestry, when attacked, "are apt to suffer from the chronic type of the disease, which runs a mild course, while those whose parents are free from tuberculosis, and have lived in an environment free from tuberculosis, are more likely to suffer from he acute or subacute forms of the disease."

5. Subjects who have suffered from scrofula, or tuberculosis of the glands, bones or joints during childhood are relatively immune to phthisis.

6. "The belief that promptness in recognition and treatment of tuberculosis will eradicate this disease, is fallacious, and the sooner we realize this fact, the better for patients and the [medical] profession."

7. Constitutional symptoms, such as cough, fever, night sweats, anorexia, tachycardia, etc., are more reliable in diagnosing incipient tuberculosis, than the signs elicited by physical diagnosis (percussion and auscultation).

8. It is a mistake to treat every *infected* child as if it had tuberculosis, the *disease*. "Even when the tracheo-bronchial glands are discovered to be enlarged, there is no reason for prohibiting school attendance, or to institute prolonged and costly treatment, except such measures as will enhance the nutrition of the child."

9. A pulmonary cavity in a tuberculous patient does not necessarily prognosticate serious results.

10. Without treatment, 50 per cent. of the tuberculous patients will be alive and more or less efficient at their occupations. This should be borne in mind when testing remedies statistically. Thanks to the normal tendency of tuberculous lesions to heal, "distilled water, bread pills, or even prayer" will accomplish the same results as most therapeutic agencies.

Fishberg considers the belief regarding adult susceptibility the most serious of these fallacies, and ascribes the "utter failure" of prophylaxis in eradicating the disease to its limitation to the prevention of *infection*. In spite of our efforts, over 90 per cent. of human beings in large cities will become infected in the early years of life, and as they are not thereafter subject to re-infection, prophylactic measures in their behalf are wasted energy. In support of his claim, he cites the great difficulty of re-infecting a tuberculous laboratory animal, the comparative immunity of seasoned city dwellers as opposed to savage tribes, and of laboratory workers, pathologists, and hospital workers, even where no precautions are taken in the disposal of sputum, and finally, the rareness of infection of one spouse by another. With the latter phenomenon, he contrasts the great frequency of conjugal venereal infection.

Statistics are not cited on the latter claim, but the author bases his conclusions upon long experience as physician for the United Hebrew Charities of New York.

As to the present efforts of physicians and health officers, he says:

It is a great injustice to exclude from human intercourse and activities one whose sputum has once shown tubercle bacilli, although he feels healthy and well able to work; to 'follow him up,' to send after him inspectors, doctors, nurses, relief workers, charity investigators, and others who visit not only his home, but also his place of employment, and warn all those who may come in contact with him. The same stupid bureaucrats teach that a consumptive who is careful, *i. e.*, who disposes properly of his sputum, is not at all dangerous even to infants and children, which is decidedly fallacious. The truth is, that it is very dangerous for an infant to remain in the same room with a person suffering from active tuberculosis, no matter how careful he may be."

The author further decries the prohibition of children from attending school, and the institution of prolonged and costly treatment, through the confounding of *infection* with *disease*. "When a child coughs, loses flesh, sweats at night, etc., and the tuberculin reaction is positive, a hasty diagnosis of tuberculosis is made," in spite of the fact that while extra pulmonary tuberculosis is rather common in school children, real pulmonary tuberculosis—*chronic phthisis*—is exceedingly rare.

Present methods of control, he thinks, have not reduced the mortality from tuberculosis, Those who want to point to the declining mortality as proof of the utility of the campaign should bear in mind the following facts: the mortality began to decline long before the fight was begun. Statistical facts from the registrar's data of England, and many states in this country prove this conclusively. Moreover, the decline has been observed in countries where no campaign has been waged. In Ireland, France, Italy, Norway, etc., where measures have been taken to prevent the disease, the mortality has not at all declined. In Belgium it has declined, while in France it has not.

Considering that the campaign has not produced the results which its votaries have ascribed to it, it is but just to ask whether it should be continued.

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Boosting Greenville.—Rare is the sanitary survey that must not be taken in the same spirit as a dose of castor oil: "It tastes bad, but it's best for you in the end." Greenville, S. C., however, receives a distinct pat on the back from Dr. L. L. Lumsden of the U. S. Public Health Service.

In the *Journal of the South Carolina Medical Association* for November, 1916, Dr. Lumsden is quoted as follows:

"Greenville County probably has the highest sanitary index in the United States. That is, no other county, predominantly agricultural, shows such a fine sanitary index.

"Seventy per cent. of the homes in this county are in good sanitary condition.

"Eighteen per cent. of the 11,751 homes visited by the public health men have complied with all sanitary suggestions, and hundreds of others will do so.

"The City of Greenville is the only city I have found in the United States where no suggestions as to sanitation were needed. The city board of health has put into operation improved sanitary ideas, so Greenville city is a leader today in matters pertaining to public health. Typhoid fever is practically extinct in the city.

"Typhoid fever in the county has been reduced by half this year. It is probable that coming years will see this disease cut down 90 per cent. as a result of the work done and the willingness to comply with sanitary rules.

"All incorporated towns, and all unincorporated towns, are either installing or have installed sanitary systems for refuse disposal. Greer, Simpsonville, Fountain Inn, West Greenville and other communities are doing what has been suggested by the public health service.

"In the county are twenty-one mill villages, counting one cotton seed oil mill. Three of these are in the city, so are already sanitary. Fifteen of the eighteen have completed, or nearly completed the installation of sanitary systems. In eleven villages the work is completed. One village has ordered the sanitary equipment, and the one not yet in line with the work will do what has been suggested.

"Rural schools are rapidly complying with suggestions for modern sanitation.

"Your county has made the wisest expenditures it could make in the creation of county health offices. The same is true of your city. The highest recommendation you can have is the health condition you show. It is now for the people to continue the work, to place proper valuation upon human life and health."

The foregoing eulogy was delievered at a public health celebration which formed the culmination of an intensive sanitary survey of the county and city of Greenville made by the U. S. Public Health Service, the S. C. State Board of Health, and the City and County Health authorities acting in coöperation.

The survey consumed nearly a year, and we read that "practically every home, numbering about 12,000 in Greenville County, has been visited by these sanitary experts. All of the cotton mills, numbering about twenty outside of the city of Greenville, have received the most careful sanitary investigations."

A street pageant, characterized as "the finest ever seen in Greenville," was a part of the celebration, and included sixty-five floats, mounted marshals, two companies of coast artillery, the boy scouts and other features. "Placarded with health slogans; the floats told true stories of Greenville County and of public health."

All honor to Greenville, her faithful public officials, and public spirited citizens!

✣

Municipal Health Administration.—E. C. Levy, Richmond, Va. (*Jour. A. M. A.*, Dec. 9, 1916), discusses municipal health administration, especially pointing out the conditions that must most seriously affect it in any one municipality. The size of the community affects the general plan of organization, and climate is of immense importance, as will be readily seen. Topographic location is also of importance. The health work of the city naturally depends to a greater or less extent on its natural surroundings. A city on low ground or in a very flat country has altogether different conditions to meet in regard to various points of sanitation, and an inland city has different problems to meet from those of a city on the seashore or any large body of water. Racial considerations must be taken into account, especially where large alien and inferior population has to be considered. The question of language also comes in here. Levy points out that these and some other differences in fundamental conditions have not been sufficiently taken account of in formulating the health work. Every indication points to the fact that public health work, and especially municipal public health work, is bound to expand in the coming years and that in a very few years we shall look back to our present performances and standards as almost medieval in their nature and scope, and he emphasizes the undesirability of making a standard health program for all cities, except in a few respects. Efficiency of the health department of a city is to be measured by the degree to which it is adapted to the needs of that particular community and not by the degree to which it conforms to any arbitrary general standard.

✣

The Whole Time County Health Officer.—Dr. P. W. Covington of the International Health Board, writing in the December number of the *Texas State Journal of Medicine*, strongly advocates full time county health officers for Texas. He estimates that a $2,500 health officer would be able to save the county about $50,000 annually. In addition to the customary activities of such an officer, he suggests a number that are new to county work.

After pointing out that in East Texas 50 per cent. of the school children are afflicted with hookworm and malaria, and that in general 20 per cent. of the school children in the United States have defective vision, while others suffer from defective teeth, tonsils, ears, and the like, he recommends that the county health officer supply the school teacher with the necessary tests for selecting those children who are likely to require a medical examination. After the examinations have been made, public meetings of parents are recommended at which the latter receive an illustrated talk on child hygiene. Parents of defective children are asked to remain after the meeting for a conference. In this way, Dr. Covington estimates that the entire county could be covered in eighty days.

A unique suggestion is that the health officer conduct dispensaries where "people could visit him to be vaccinated for smallpox or typhoid, or be examined for hookworm, or where any citizen could visit him for a cursory examination for beginning tuberculosis or Bright's, or degenerative changes in the arteries or heart, or for cancer etc." The health officer would not treat such cases, but merely indicate the need for medical care. Counties in North Carolian are referred to where the health officer has in this way immunized from one-third to one-half of the entire population against typhoid alone.

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Trend Toward State Medical Service.—The question of socializing medical service has been discussed pro and con in American medical circles—in some instances with considerable bitterness. That interest is not confined to the medical profession is shown by the space given to the subject in such magazines as the *Literary Digest*.

In European countries the movement has made more progress than in America. We quote from the *Medical Officer* (London, Nov. 18, 1916):

"At the annual meeting of the Scottish Association of Insurance Committees, held recently at Aberdeen, Dr. Matthew Hay, M. O. H., made some important remarks regarding the desirability of a state medical service. He pointed out that so difficult of divorce were treatment and prevention in the communal care of any disease, and so fundamentally similar were the measures of prevention for diseases in general, that he would gladly see some joint committee becoming an advisory health committee for each area, not only in regard to tuberculosis, but in regard to health and disease in general. . . .

"The Insurance Act had already provided what was almost a state medical service for workers. The last Education Act enforced a medical service for school children; the Government by a Treasury grant was asking for a similar service for infants and mothers, and was almost at the same moment compelling arrangements for the treatment at the public cost of all sufferers from venereal diseases; the local authority was taking an ever-growing part in the treatment as well as the control of infectious disease; the Poor Law authorities had long provided for the treatment of the poor, and the Factory Acts were dealing more and more with the health of factory workers, and especially with occupational diseases.

"They were now sadly in need of a system under which all these services with those of the medical institutions of all kinds could be coördinated or fused, and the best results obtained, with no omissions, with no overlapping, and therefore with economy, and he felt sure also with efficiency. Such a unified service, properly thought out and properly equipped in respect of every modern requirement, would not only make available for everyone the full resources of the most skilled and specialized medical treatment, whether domiciliary or institutional, but could be also made to take a much larger and a much more effective part in preventive medicine than at present.

"In his opinion it would come. It was only a question of time."

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Confusion of Typhoid with Paratyphoid.—Capt. Jay D. Whitan of the U. S. Medical Corps, calls attention to this subject in the *Texas Journal of Medicine* for December, 1916.

"In India," he says, "15 per cent. of cases reported clinically as typhoid fever are found bacteriologically to be paratyphoid infections. Unquestionably a large percentage of paratyphoid infection is diagnosed and reported as typhoid fever, the disease being much more common than is generally supposed."

Among his conclusions are the following:

"Considerable evidence has been submitted by competent observers to show that antityphoid vaccination does not sufficiently protect against paratyphoid infections and that a polyvalent vaccine should be used, if such protection is necessary.

"The fighting forces in Europe have suffered greatly from paratyphoid infections which, it is possible, might have been prevented had poly valent vaccine been used."

He believes that carriers play the most important rôle in the transmission of the disease, and that epidemics resembling food poisoning must be more common than is generally supposed, the trench diarrhea of Europe being an example.

Although usually mild, the disease may cause extremely severe complications, even death.

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District Health Organizations.—C. St. Clair Drake, Springfield, Ill. (*Jour. A. M. A.*, Dec. 9, 1916), describes the recent revival of health laws in Illinois and the difficulties met with in enforcing them. For twenty-five years or more Illinois has had no progressive policy, and there is little or no popular interest in sanitary affairs. While there were many good laws passed, the appropriations allowed but five districts in the state to be made. The districts are outlined at the discretion of the state board of health, which aims to secure a full time medical health officer for each county of the state. Future legislation will have to be enacted for their support. The present district health officers, coming in close contact with the various communities, demonstrate the value of trained, efficient guidance, conducting an educational campaign and assuming a direct supervision which will naturally continue over the county health officers if they are appointed. They constitute a long step toward efficient local health supervision. The district health officer is the general representative of the state board of health in his district, where he is supposed to familiarize himself with the sanitary conditions and to take action in the suppression and prevention of communicable diseases, having available the services of the state epidemiologist and the coöperation of all the state diagnostic laboratories. It will be his duty to see that the vital statistics are properly kept up and to coöperate with all local and private agencies in every form of public health publicity and education. He is expected to maintain an intimate relationship with all local health officials. After having the district health officer plan in operation, it is felt in Illinois that it is the logical basis for developing an extensive and intensive public health system.

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Oxygenated Milk.—Guilford reports experiments at the Presbyterian Hospital at Chicago of the treatment of milk with hydrogen peroxid (one liter of H_2O_2 to 80 liters of milk). "The milk is then heated to 122–128 deg. F. for one half hour, being stirred by a fan in the reservoir so that it is kept in motion the whole time. . . . The milk is then withdrawn and bottled hot. It is then kept on ice until used. . . . In one sense this is preserved milk, but it is a preserved milk without preservatives because at the end of half an hour's treatment only a trace of hydrogen peroxid can be obtained."

Raw milk containing 3,000,000 bacteria per cc. was found to be sterile after treatment, except in one case "when there appeared approximately 100,000 streptococci per cc. The bacteria which appeared in the cultures of raw milk were chiefly streptococci, colon bacilli, and staphylococci." Samples artificially infected with known virulent strains of hemolytic strains of streptococci, typhoid and diphtheria bacilli after being oxygenated and plated were found sterile after seventy-two hours' incubation. Before treatment the counts were 2.5 to 3 million per cc.

Infant feeding with this milk during one year showed no deleterious effects. The milk has stood as long as two weeks at summer temperature without souring.

The advantages claimed are the safest milk from all standpoints at about six cents per quart, an ever-ready supply of "fresh" milk, and absence of danger from souring as well as from pathogenic organisms.

Chemical changes have not been thoroughly studied, although rise of cream and coagulating and digestive processes with ferments are found to be normal, as with raw milk.

The advisability or possibility of marketing on a large scale is not stated.

The paper is published in the *New York Medical Journal* for December 2, 1916.

◆

Typhoid Case-Fatality by Age Groups.—Incomplete reporting of typhoid cases has long been a thorn in the side of the health officer and the epidemiologist. The prevalence of the disease has usually been estimated by multiplying the number of deaths by an arbitrary factor ranging from 10 or less to 15. However, as Freeman points out in *Public Health Reports* of December 8, 1916, the case-fatality varies with age from 5 per cent. in young children to almost 50 per cent. in the age group, 60 and over. Manifestly, therefore, the factor to be used in an orphan asylum, for example, would be very different from that to be used in the case of a home for the aged, in computing the prevalence of typhoid.

Case-fatality tables for typhoid covering large areas and long time periods are very rare, and the table of the Pennsylvania State Health Department for 1910–12, is therefore, very valuable. For the three year period there were reported 35,314 cases of typhoid fever, and 4,918 deaths, yielding a gross fatality rate of 13.5 per cent.

As to the accuracy of this figure, Freeman says:

"The reporting of cases of typhoid fever for the state of Pennsylvania is probably of average completeness and the registration of deaths may be regarded as accurate and complete. The error in these statistics will almost certainly lie in the direction of failure to recognize and report cases of typhoid fever, and the total fatality rate is, therefore, in all probability too high. There is no reason, however, to suspect that the failure to report recognized cases affects any one age period more than another, and while the ratios of cases to deaths may be too low in general, the relation of the fatality rates, as between different age periods, is in all probability approximately correct."

A curve accompanies the article quoted, showing that the fatality rate is lowest for the age group 5–9, viz., about 6 per cent. The curve then rises for the years of adolescence, rises very slowly through the years of maturity to the age of 45, and then takes a sharp turn upward.

The combined figures for 1910, 1911 and 1912 for Pennsylvania follow:

Age in years.	Three years combined.		Case fatality (per cent.).	Cases per death.
	Cases.	Deaths.		
Under 5	1,623	194	11.9	8.4
5–9	4,840	280	5.8	17.3
10–14	4,893	309	6.3	15.8
15–19	5,396	636	11.8	8.5
20–24	5,431	851	15.7	6.4
25–29	3,816	690	18.1	5.5
30–34	2,685	463	17.2	5.8
35–39	1,947	407	20.9	4.8
40–44	1,391	288	20.7	4.8
45–49	972	223	22.9	4.4
50–54	650	192	29.5	3.4
55–59	367	140	38.2	2.6
60 and over	524	243	46.4	2.2
Unknown	779	2	. .	....
All ages	35,314	4,918	13.5	7.2

The comparatively high fatality shown in the table for ages under 5 is probably fallacious, and due to the failure to diagnose typhoid in infants and young children.

The value of such tables and curves is great, and Freeman says, in concluding, "It is hoped that the increasing volume of morbidity statistics now being accumulated will be published in such form as to make possible further studies of the very interesting variations in morbidity and mortality at different age periods.

◆

Concentrating T. B. in Sputum and Urine.—Kraus and Fleming, in *Journal of Laboratory and Clinical Medicine* for September, give a method which is said to be cheaper and more satisfactory than the antiformin-chloroform method. Salt solution is substituted for antiformin, and gasoline for chloroform or ligroin.

"For Sputum: Place 5 cc. sputum in a 15 cc. centrifuge tube, add 5 cc. of a 10 per cent. sodium chloride solution and shake in a shaking machine, or by hand if none available, until it is a thin homogenous fluid as free from clumps as possible. Add 0.5 cc. of gasoline and repeat shaking process until the gasoline is thoroughly emulsified. Centrifuge at a low rate of speed until the gasoline forms a supernatant liquid immediately beneath which is a scummy layer in which tubercle bacilli will be found, if present in original specimen.

"For Urine: Place 10 cc. urine in 15 cc. centrifuge tube and centrifuge three minutes at a rapid rate of speed. Pour off supernatant feuid. To the sediment add 10 cc. of original urine and 1 gram of sodium chloride. Shake thoroughly or until the sodium chloride is dissolved, and add 0.5 cc. of gasoline. Shake again for about five minutes, then centrifuge slowly. The scum beneath the gasoline contains tubercle bacilli, if present.

"Often instead of using a centrifuge tube, a large size, narrow-neck Babcock milk bottle is preferable, in that it affords greater concentration of the scum containing tubercle bacilli.

"A trace of egg albumen to slide surface before making smear secures better fixation."

⁂

Public Health Nursing Control.—In the October number of the *Public Health Nurse Quarterly* appears a recommendation of the National Organization "that if public health nursing be transferred from private to municipal control every influence should be used to have advisory boards, composed of people interested in standards of nursing, appointed to confer with the municipal officers."

Follow-up work in the homes of patients dismissed from institutions for the mentally ill is also recommended.

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Damages for Pollution of Streams.—Suit was brought against the city of Princeton, Ky., for damages caused by the pollution of a creek by the city sewage. The court was also asked to issue an injunction prohibiting the city from discharging sewage into the creek. The circuit court granted the injunction and awarded $2,500 damages against the city.

The Court of Appeals of Kentucky affirmed the judgment for damages, but the injunction was dismissed, as the court found from the evidence that it was possible to discharge the sewage into the stream in such a way as not seriously to injure owners of property below the sewer outlet.

The opinion appears in the issue of the *Public Health Reports,* for December 15, 1916.

Industrial Hygiene and Sanitation.

Industrial Health Insurance.—There is no question at present agitated in the medical profession more thoroughly than the question of industrial health insurance. The medical journals devote much space to its discussion. and meetings are being held all over the country with the purpose of acquainting the members of the medical fraternity with the vital features of health insurance legislation. While new to this country it is far from being a new social phenomenon. It was established in Germany as early as 1883 and in England previous to the outbreak of the present war. The opposition of the medical profession in England to the social legislation is well known but the actual operation of the law has brought about a distinct change in the attitude of men formerly opposing its enactment. It appears that our country is ripe at present for this revolutionary change, and the very wide-spread agitation serves the useful purpose of harmonizing the specific interests of employer, employee and physician. The medical profession in the United States more and more recognizes the intrinsic justice and desirability of industrial health insurance and is anxious to secure such conditions and details of administration as shall make such acts equitable and beneficial to all.

The Doten Bill, a measure introduced before the Massachusetts General Court at its latest session, is exhaustively treated in a symposium of articles which appeared in the *Boston Medical and Surgical Journal of* December 21, 1916. The symposium is led by an address of John C. Crosby, Justice of the Massachusetts Supreme Court on "The Workingmen's Compensation Act." The writer reviews historically the legislation enacted abroad and here with particular reference to Massachusetts. The present Compensation Act was adopted by the Massachusetts legislature in 1911. It went first into effect on July 1, 1912. It is modeled in part on the German and in part on the English systems. In its practical workings the act has taken away much of the bitterness between labor and capital occasioned by personal injury cases in the courts. The law is administered by the Industrial Accident Board. The wage loss per day in Massachusetts is conservatively estimated at $10,000, the economic loss at more than three times that figure. Up to date thirty-one states and two territories in the United States have adopted laws which provide for the payment of compensation to injured workmen and their families. The number of reported injuries in the third year of the act has grown to 100,000. It is of interest to note that the English act considers a nervous shock caused by the sight of injuries sustained by a fellow workman an "accident" within the meaning of the law. It has also been held in England that a man who was murdered was killed by "accident," but injury caused by frost-bite was not considered an "accident." It is by no means a simple matter to decide on the validity of certain claims and the Supreme Judicial Court of Massachusetts is constantly reviewing such cases. The law being of recent growth and development will undoubtedly require, from time to time, perfecting amendments.

Dr. F. J. Cotton considers the workingmen's accident and sickness insurance from the standpoint of the physician. He points to the revolutionary features of the act and believes that it will not benefit the practitioner. The Doten Bill provides that 40 per cent. of the contribution be provided by the employer, 40 per cent. by the employee and 20 per cent. by the state. The provisions of the bill with reference to the medical administration are printed in full and discussed at some length. Dr. Cotton points out that the medical profession does not "wish to stand in the way of social progress, but it would be better to postpone this matter a little than to have hasty legislation first and hopeless complications afterwards."

Dr. Francis D. Donaghue discusses the history and operation of the Massachusetts Workingmen's Compensation Law. Dr. W. H. Merrill discusses the act from the point of view of the general practitioners. He expresses the belief that a further reduction in the income of the physicians in the industrial centres will certainly reduce the efficiency of the service. It is the duty of the profession to attempt to so shape the medical details of legislation that the profession's usefulness may not be curtailed. John P. Meade reviews the subject from the standpoint of organized labor. Nearly 800,000 workmen are now within the scope of the Massachusetts act, and are vitally concerned with its administration. The victim of industrial accident should be given the right of choosing his own physician. Dr. H. I. Cronin cites his experiences with the Compensation Act in Cambridge, Mass. Dr. Francis W. Anthony believes it would be very disadvantageous if the insurance was developed so that it was state insurance. This would mean political appointments, and that means, inferior service. The bill should be so framed that the medical services be paid for per visitation, but there must be with this a limitation to the charge. Every licensed physician ought to have an opportunity to participate in this line of work. If the legislation goes through in the form of state insurance it means the ruination of the practice of from 20 to 30 per cent. of the physicians now engaged in the Commonwealth. If the matter is placed in the hands of insurance companies who are allowed to select an individual the effect upon the profession will be practically the same.

The *Boston Medical and Surgical Journal* of December 21 reproduces a table under the heading "Tendencies in Health Insurance Legislation." This table was prepared by the American Association of Labor Legislation and compares in a very clear manner legislation effected in Germany, Great Britain, Austria, Netherlands and Norway, with the Standard Bill of the American Association for Labor Legislation. Any one who wants to study the details of the extremely complex problem will do well to aquaint himself with this table.

Any one interested in the above subject, social insurance, will find a compilation of very useful facts in the December issue of the *Illinois Medical Journal*, pages 421–444.

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The Work of the Municipality in Industrial Hygiene.—The city of New York recognized sometime ago that industrial hygiene should be administered with legal sanction to compel proper environmental and industrial conditions in all shops, factories and mercantile establishments. The Division of Industrial Hygiene of the Bureau of Preventable Diseases was organized in March, 1915. The Sanitary Code was reinforced so as to give the Department of Health special powers in the field of industrial hygiene. The first annual report of the new division, prepared by Dr. J. I. Harris, chief, Division of Industrial Hygiene, appeared in the October *Bulletin of the Department of Health* of the city of New York. The report is extremely interesting and instructive. It represents a new field of municipal endeavor which is here to stay. The channels of information, which form the basis of the field work, are (1) complaints of citizens, (2) notification by physicians, dispensaries and hospitals, (3) search of death certificates, (4) intensive studies of specially selected hazardous industries. The private physicians are not as yet fully alive to the far reaching importance of the new division largely on account of the newness of the field of work. The number of occupational diseases reported by private physicians and hospitals is scant. Other activities initiated by the division are (1) investigation of department stores, (2) supervision of contract labor, (3) follow-up of children entering industries, (4) coöperation with labor unions in factory sanitation. A large amount of publicity work was carried on. The number of people examined at the Occupational Clinic during the first year of active work totaled not less than 42,042. A significant step in the right direction is the compulsory examination of food handlers which began on August 1, 1915, but the problem is too big to be worked out without the coöperation of private physicians. All of this work is done, however, under control and supervision by the Division of Industrial Hygiene. Other activities pertain to social service, home visiting and industrial exhibit. The results of medical examinations and factory inspections are available in tabulated form.

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Occupational Disease Bureau in Hospital.— At the last meeting of the medical board of the Union Hospital, borough of the Bronx, a division of Occupational Diseases was established, and Dr. Frederic W. Loughran, of the staff, was designated as attending physician in charge.

A glance at the history cards of almost any hospital will show that but little attention has been paid to the occupation of the patient. A man classed as a "laborer" might be working in a lead factory and in peril of lead poisoning, or in a hat factory and liable to mercury poisoning, or he might be working out of doors under the best of sanitary and hygienic conditions.

While deaths from occupational diseases are very rare, it is because a secondary disease terminates the condition brought about by the occupation. The vast majority of hospital patients are, no doubt, suffering from diseases partly occupational, and it is to this class of patients that the greatest care will be given in compiling their histories, for with an accurate history, the diagnosis of the specific occupational disease is comparatively easy, and with an intensive inquiry into personal, environmental, and industrial hygiene, it is hoped that the effort to correlate these occupational health hazards with the other etiological factors in the case will be productive of good results.

Patients, before their discharge, will be instructed in methods of preventing or lessening the dangers that surround them while at work; and, should the opportunity offer, employers will be advised as to the value of industrial hygiene.

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A New State Museum of Safety.—In establishing a State Museum of Safety, Kansas has followed the lead of California and Massachusetts which for several years past have conducted museums of safety in connection with the work of their respective industrial accident commissions. For over a year Commissioner P. J. McBride has been collecting devices, photographs, charts, publications and other material relating to industrial accidents and their prevention, which would prove of educational value to employers of labor throughout the state. At the state fair in Topeka the safety museum proved one of the most popular attractions there. It is the intention of the Department of Labor and Industry to ask for sufficient appropriation to make similar exhibits at other fairs and public gatherings in Kansas. It is hoped that a railway car may be secured which may be equipped as a traveling safety museum.— *Bulletin of the American Museum of Safety*, November, 1916.

The Fifth Annual Congress of the National Safety Council, held in Detroit October 17 to 20, was a huge success. The council has 2,340 members and it is estimated that 2,000 of these attended the congress. Over 8,000 looked at the commercial safety exhibit. The various papers and discussions brought out a wealth of information. The Youngstown Sheet and Tube Company reduced accidents 75 per cent. during the week of October 9 by offering gold watches to all superintendents, their assistants and foremen securing the greatest reduction for that period. Minor prizes were distributed among the workmen, score cards were placed at the plant entrance and many novel efforts made to arouse interest. This company also issues a book for employees profusely illustrated with horrible examples of what not to do and good advice in the form of suggestions. W. L. Chandler of the Dodge Manufacturing Company at Mishawaka, Ind., gave a report on the universal danger sign problem, the result of which was the adoption of a symbol. Forty-eight specimen test emblems were exhibited. The first test was as to color. Practical tests in a dark room with the light gradually increased proved that white showed out very much the best of the lot. Yellow and orange made also good showings. Red did not show up well. It took approximately three times as much light to permit yellow to be seen as it did for white and about five times as much for red as it did for white. White was visible to some degree out doors all during the twenty-four hours, while red was visible to the same degree only about nine or ten hours a day on the average. The danger sign recommended by Mr. Chandler's committee consists of a red ball upon a white cross of the Maltese variety, which in turn is placed on a black background. The exact proportions of this emblem are to be announced by the National Safety Council as soon as it has completed its patent protection, which is now in progress. On the afternoon of the 20th were contests of first aid teams contributed by the mining members of the council, and demonstrations of rescue work, explosibility of dust and flour.—*The Dodge Idea*, November, 1916.

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A Departure in Railroad Signaling.—Announcement has been made by the Pennsylvania Railroad systems of the adoption of a new color scheme for signal lights. The change, as set forth by the *Bulletin of the American Museum of Safety*, November, 1916, is for the purpose of increasing safety and efficiency in the operation of trains. The important feature of the new color scheme is to be the entire elimination of white lights as signal indications. This has been rendered desirable on account of the increasing use of white lights of various kinds in buildings, driveways, roads and streets near the railroad's right of way. Before white could be successfully eliminated from the scheme it was found necessary to procure a yellow glass that would give a distinctive and brilliant light of that color. Such a glass has now been produced. Under the improved scheme of color indication for signals, green lights will mean "clear" or "proceed" and the new yellow, "caution." Red will continue to mean "stop."

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Fume Poisoning from Nitric and Mixed Acids—The inhalation of dense nitrous fumes for a short time, or weaker fumes for a more prolonged period (L. A. DeBlois, *Safety Engineering*, November, 1916) may bring on a feeling of suffocation attended by coughing and local soreness in the upper air passages. In most cases the primary effects are entirely relieved by going into the open air and the man returns to his work suffering no ill effects. If the inhalation has been too great the victim may become weak and short of breath. In fatal cases he expectorates a frothy, straw colored sticky fluid. These conditions are the result of edema of the lungs. When the edema once sets in little can be done to arrest its progress, but in all cases of fume sickness chloroform is administered at once internally at the du Pont de Nemours Co. It undoubtedly gives some relief. The most important of the preventive measures is the promulgation among the men of a full knowledge of the dangers of nitrous fumes. The correct solution of the fume sickness problem is proper ventilation, but this is not always easily accomplished. Considerable experimental work has been done in the neutralization of nitrous fumes by aqua ammonia or ammonium carbonate solution sprayed directly into the air by compressed air atomizers. These proved remarkably effective and not too expensive. Suitable exhaust systems are to be preferred, however. During March and April, with a working force of 540 men working in three shifts at the du Pont de Nemours Co., there were over 740 cases of fume sickness and 6 fatalities. In the past six months the number of reported cases has been greatly reduced and not one fatality has occurred.

⁂

The Accident Problem as It Concerns the General Public.—It is conservatively estimated (F. L. Hoffman in *Safety Engineering*, November 1916) that the mortality from accidents of all kinds in the continental United States during 1916 will be approximately 75,000, in contrast to a corresponding estimate of 82,000 caused by accidents during the year 1913. Of these estimated 75,000 fatalities, approximately 11,000 will be caused by railways, 14,000 by falls, 8,500 by drowning, and 11,000 by vehicular accidents. Street car accidents have decreased from 38 per million population in 1910 to 28 in 1915. Total automobile accidents in the United States registration area have increased steadily from 6.5 per million in 1907 to 59.3 in 1915. The fire hazard continues to cause a large loss of life. Accidental poisonings also have not been reduced to the extent required. Electrical accidents are not as frequent as the ever-increasing use of electricity would seem to suggest. A large number of other statistical data are cited, all of which goes to show that there is gratifying evidence of genuine progress.

⁂

Industrial Diseases in New Jersey.—Under the New Jersey law, lead, phosphorus, arsenic or mercury poisoning, contracted as a result of occupation, is reportable. The state board of health report for 1915 shows that there were reported during the year fifty-six cases of lead poisoning, two cases of mercury poisoning, one case of arsenic poisoning and six cases of anthrax. The board, while required to collect statistics of industrial diseases, has no authority to regulate conditions in factories in which such diseases occur. Such reports, while interesting, are comparatively valueless unless supplemented by amendatory legislation, giving the state board power to deal in a remedial way with the conditions which produce diseases.—*Journal of the American Medical Association*, December 9, 1916.

Statistics of Mines and Quarries in Ohio, 1915.—The first section of a recent *Bulletin of the Industrial Commission of Ohio*, deals with coal mines and shows production, number of employees, days in operation, average wages, total annual wage and salary payments, and coal mine accidents. The other five sections of the report deal with fire clay mines, gypsum mines, iron mines, limestone quarries, and sandstone quarries. Wages for 50,474 employees in mines and quarries in Ohio are shown in this report. In 1915 one coal miner was killed to every 658 men employed.

⁂

Molten Metal Hazard Reduced.—A few years ago, according to the *Monthly Bulletin, Pennsylvania Department of Labor and Industry*, October, 1916, interesting experiments on the protection of legs and feet from splashing molten iron were carried on at William Sellers & Co., manufacturers of machine tools in Philadelphia, Pa. The experiments showed that closely woven smooth faced fabrics (though combustible when exposed to a candle flame) shed molten iron like water from a duck's back. Even a sheet of paper was subjected to this test several times without flaming. As a result of these tests the workers are now protected with leggings of closely woven canvas. The leggings were introduced in May, 1912, and since that time no time has been lost by any man on account of burns on legs or feet which formerly was a frequent occurrence.

⁂

The October Bulletin of the Pennsylvania Department of Labor and Industry contains the "Rules and Rulings of the Pennsylvania Workmen's Compensation Board" as well as a considerable number of articles bespeaking well of the splendid work which is being done in industrial hygiene in Pennsylvania. During the first nine months of 1916, 188,278 industrial employees were injured while at work and of that number 1,827 died as a result of their injuries.

⁂

Fight for Control of Occupational Diseases is the title of a very instructive paper presented by Dr. E. R. Hayhurst (*Hospital Management*, November, 1916) at the October meeting of the National Safety Council in Detroit. The author points out the opportunity of the industrial physician in studying causes and finding remedies and the effect of this modern phase of sanitation upon industrial progress.

⁂

Accidents in the Gas Industry.—The report of the committee on analysis of accidents in the gas industry, submitted at the eleventh annual meeting of the American Gas Institute in October last, gives a record of 10,000 accidents, 3,763 of which were reported during the past institute year by 104 companies in thirty states. Of the 10,000 cases 27 were fatalities. Of the accidents 67.2 per cent. are classed as lacerations or contusions and 2.8 per cent. as illness caused by gas. The gas industry cannot be classified as extra hazardous.—*Monthly Review of U. S. Bureau of Labor Statistics*, December, 1916.

⁂

Workmen's Compensation Law in Japan.—By a decree issued August 2, 1916, in accordance with the provisions of the factory act of March 28, 1911, Japan has introduced a system of compensation for injuries to certain classes of workers. The decree applies to factory workers only. A minimum compensation is provided for in case of injury, sickness, or death, sustained while at work. The governor of the prefecture is authorized to mediate all disputes.—*Monthly Review of U. S. Bureau of Labor Statistics*, December, 1916.

⁂

The December Issue of the Monthly Review of the U. S. Bureau of Labor Statistics contains a number of articles that throw some interesting light on the abnormal industrial conditions in war-stricken England. The statistical material presented is very instructive. The articles pertain to "Legal Regulation of Welfare Work," "Value of Welfare Supervision to the Employer," "Woman's War Work," "Juvenile Employment," "New Studies on Industrial Fatigue," "Output in Relation to Hours of Work" and to the "Report of the Chief Inspector of Factories and Workshops in Great Britain."

⁂

The Scope of Industrial Hygiene.—This article (*Journal of the American Medical Association*, December 16) represents the report by a committee appointed by the American Medical Association to outline the immediate problems of industrial hygiene. The committee reports that the scope of activities of those engaged in industrial hygiene should embrace (1) first aid to the injured, (2) the safety first movement, (3) inquiries into the physical status of workers in relation to accidents, and physical examination of workers, (4) medical supervision and care of employees, (5) sanitation of places of employment, (6) sanitation of environment outside the workshop, (7) consideration of the health and habits of the individual which makes for efficiency, and (8) stimulation of interest in the formation of sickness and insurance societies. An adequate health insurance system will increase efficiency and enlarge the opportunities of the medical profession.

⁂

Tracheobronchitis Due to Nitric Acid Fumes.—Dr. C. L. Jackson of New York City (*New York Medical Journal*, November 4) gives a clinical description of a case due to the exposure to nitric acid fumes for two hours. The symptoms were typical. He was choked with his own secretions to such an extent that he was apparently drowning. A tracheotomy had to be performed. The cyanosis disappeared as the secretions were gotten rid of. The patient was discharged well at the end of three weeks.

Personal Notes.

During the last week in November the public health and scientific profession lost one of its most able and active members by the death of Dr. Martin I. Wilbert. Doctor Wilbert was technical assistant in the Hygienic Laboratory of the United States Public Health Service, and was one of the first men to become active in the organization of the Council on Pharmacy and Chemistry of the American Medical Association. In an editorial the *Journal of the American Medical Association* states that:

"His very life seemed to be wrapped up in bringing about better conditions both in pharmacy and in medicine. He was one of the few men who serve as connecting links between the two professions. He spent his life in trying to stem the tide of commercialism in both, and the full measure of his influence at Washington in behalf of the public health will never be fully known."

⁂

Dr. Arthur Lederer and A. W. Hedrich have been added to the personnel of the JOURNAL as editorial assistants. Dr. Lederer reviews for the Industrial Hygiene section, and Mr. Hedrich for the Public Health Notes.

⁂

At the 104th Annual Meeting of the Academy of Sciences held in December, Dr. Samuel G. Dixon, Commissioner of Health of Pennsylvania, was reëlected president.

⁂

Miss S. H. Cabaniss has been appointed director of the new public health service, established by the North Carolina State Department of Health, through its bureau of tuberculosis. One half of the expenses incurred by this service are to be paid by the Metropolitan Life Insurance Company.

⁂

Dr. William L. Culpepper has resigned as first assistant bacteriologist of the Syracuse city laboratory to accept a position with the International Health Board of the Rockefeller Foundation. Dr. W. E. Muns, formerly with the Belleview hospital of New York City, has been appointed to succeed Dr. Culpepper.

Dr. Wm. C. Peters of Bangor, Maine, was recently elected president of the Maine Antituberculosis Association.

⁂

At the recent annual meeting of the American Social Hygiene Association, Dr. William A. Evans of Chicago, and Dr. Hermann M. Biggs of New York, were added to the Board of Directors of the Association.

⁂

Sherman C. Kingsley of Chicago has been appointed secretary of the new Cleveland Welfare Federation. He has been most active in social and civil movements for more than a decade and has gained much experience in this work by his connection with welfare movements in Brooklyn, Boston and Chicago.

⁂

John Ihlder has been appointed secretary of the Philadelphia Housing Association. Mr. Ihlder was previously field secretary of the National Housing Association, and has during the past year been special adviser for several extensive housing surveys, as well as having been for a number of years advisory editor in the field of housing for the *Survey*.

⁂

At the annual meeting of the Kansas Association of Graduate Nurses, a state organization, known as the Kansas State Organization of Public Health Nursing, was formed by the public health nurses.

The officers elected were: Miss C. C. Elder, Atchinson, President; Miss Laura Neiswanger, Topeka, Vice-President; Miss Mary Workman, Pittsburg, Secretary. Seventeen members signed the constitution and it is hoped that the number will be increased to forty during the year.

⁂

Dr. William H. Coon, formerly director of the department of industrial hygiene of a large rubber manufacturing plant at Chicopee, Mass., has been appointed executive officer of the commission created by Harvard University to work in coöperation with the Massachusetts State Board of Health in the study of infantile paralysis. A clinic for the benefit of children paralysed by the recent epidemic of infantile paralysis has already been opened at the Boston Children's Hospital, and will be held three times a week.

* * *

Philip Skrainka, M. D., has severed his connections with the *Interstate Medical Journal*, St. Louis, as literary editor, and will start a new monthly medical journal in February, the name of which will probably be *Medicine and Surgery.*

* * *

Mr. W. H. Junkins has been appointed agent of the Board of Health of Westfield, Mass.

* * *

The following persons were elected to membership in the American Public Health Association, December 20, 1916:

Mr. August E. Hansen, New York City, Sanitary Engineer.

Miss H. D. Whitehead, Petersburg, Va., Registered Nurse.

Mrs. Charles V. Chapin, Providence, R. I.

Mrs. Norman B. Scofield, Sunnyvale, Cal., Health Officer.

Henry Esson Young, M. D., Victoria, B. C., Secretary, Provincial Board of Health.

Mr. H. E. Barnard, Indianapolis, Ind.

Mr. Joseph Dorman, Berkeley, Cal., Asst. Sanitary Engineer.

Mr. Geo. D. Makepeace, Cleveland, O., Chemist.

A. B. Emmons, 2d, M. D., Boston, Mass., Medical Director.

Current Public Health Literature.

AMERICAN.

American Journal of Diseases of Children, Chicago.

12. December.

Fresh Air in Pediatric Practice. R. G. Freeman.
Review of the Literature of Respiratory Diseases for the Past Year. C. H. Smith.

American Journal of Nursing, Baltimore.

XVII. December.

Some Principles of Infant Feeding. J. C. Carter.
Diseases of the Throat. C. R. C. Borden.
Tracing the Sources and Limiting the Spread of Infantile Paralysis. Charlotte Talley.

Boston Medical and Surgical Journal.

CLXXV. December 14.

History of the Growth of the Anti-Tuberculosis Movement in Massachusetts and the Lessons to be Learned Therefrom. V. Y. Bowditch.
Some of the Clinical Evidence Relating to the Etiology of Epilepsy Including Some Notes on the Condition of the Teeth as a Factor in Its Production, and Its Relation to Alcoholism and Mental Defect. Hale Powers.

December 21, 1916.

The Workingmen's Compensation Act. J. C. Crosby.
A Consideration of Workingmen's Accident and Sickness Insurance in their Relations to the Medical Profession. F. J. Cotton.
The History and Operation of the Massachusetts Workingmen's Compensation Law. F. D. Donoghue.
Workingmen's Compensation for Accident and Sickness from the Point of View of Organized Labor. J. P. Meade.
The Administration of the Workingmen's Compensation Act by the City of Cambridge, Mass. H. J. Cronin.
Industrial Health Legislation. F. W. Anthony.
The Medical Department of a Modern Industrial Plant. F. O. West.
Medical Aspects of Social Insurance. Editorial.

December 28.

Anaphylactic Action of Grains on the Respiratory Tract. J. A. Turnbull.
Routine Mental Tests as the Proper Basis of Practical Measures in Social Service: A First Study made from 30,000 Cases Cared for by 27 Organizations in Boston and Surrounding Districts. Helen M. Wright.

Buffalo Medical Journal.

72. December.

The Attitude of the Family Physician During an Epidemic of Poliomyelitis. I. M. Snow.
Discussion on Poliomyelitis. E. Clark.
Preliminary Classification of Mineral Springs. F. v. Oefele.
Grading of Milk Supplies. S. W. Bateson.

Journal of the American Medical Association, Chicago.

LXVII. December 2.

Acute Purulent Infections of the Nose, Throat and Ear. Our Responsibility to the Public. Hill Hastings.
Dermatologic Dietetics. E. D. Chipman.
The Quantitative Effect of Salvarsan on the Wassermann Reaction of the Blood. J. T. King.

December 9.

Municipal Health Administration. E. C. Levy.
The Problem of Diphtheria Carriers. Sophie Rabinoff.
District Health Organization. C. St. Clair Drake.
Institutional Typhoid Epidemic Combated by Vaccination. P. B. Newcomb.

December 16.

County Health Administration. W. S. Rankin.
Constitutional Inferiority. M. J. Karpas.

December 23.

Hereditary Syphilis as a Cause of Chronic Invalidism, and the Diagnosis by Intensive Familial Study. H. F. Stoll.

Some Points About the Hook Worm Disease, Its Diagnosis and Treatment. W. C. Billings.
The Geographic Distribution of Amebiasis. A. H. Sanford.
Infectious Endocarditis. G. E. Ebright.
Experimental Scurvy Produced in Guinea-Pigs by Milk and Milk Products. J. J. Moore and Leila Jackson.
A Reaction of Immunity in Acute Poliomyelitis. George Mathers and Ruth T. Tunnicliff.

December 30. Index Number.

Certain Aspects of Bronchial, Pulmonary and Pleural Disease. F. T. Lord.
A Comparative Study of Salvarsan and Neosalvarsan in the Treatment of Syphilis. W. B. Trimble and J. J. Rothwell.
Notes on the Teaching and Treatment of Syphilis. H. G. Irvine.
The Quantitative Relationship of Milk-Borne Infection in the Transmission of Human Communicable Diseases. E. R. Kelley.
The Sanitation of the Shell Fish Industry. H. S. Cumming.
Health Laboratory Organization. W. H. Park

Journal of Bacteriology, Baltimore.

1. November.

Studies in the Nomenclature and Classification of Bacteria. The Problem of Bacterial Nomenclature. R. E. Buchanan.
The Oxygen Requirements of Biological Soil Processes. T. J. Murray.
The Preparation of Culture Media from Whole Blood. R. A. Kesler.
Preliminary Note on the Classification of Some Lactose Fermenting Bacteria. Max Levine.
A New Ice Sampler. Myrtle Greenfield.
Apparent Recovery of a Hen Infected with Bacillary White Diarrhea (As Determined by the Macroscopic Agglutination Test). G. D. Horton.
Observations sur L'Influence Chimique des Milieux de Culture sur L'Indol par les Coli-Bacilles et par les Bacilles Typhiques. E. Zunz and P. György.
Some Regulating Factors in Bacterial Metabolism. I. J. Kligler.

Journal of the American Water Works Association, Baltimore.

3. December.

Recovery of Spent Lime at the Columbus Water Softening and Purification Works. C. P. Hoover.
Some Problems of the State Water Laboratory. L. H. Van Buskirk.
Mt. Kisco Sewage Disposal Plant. T. D. L. Coffin and F. E. Hale.
Tests for Bacillus Coli as an Indicator of Water Pollution. C.-E. A. Winslow.
A New Raw Water Supply for the City of McKeesport, Pa. E. C. Trax
A Comparison of "Temporary Hardness" with Alkalinity in Natural Waters. A. M. Buswell.
Freezing of Water in Subaqueous Mains Laid in Salt Water and in Mains and Services Laid on Land. W. W. Brush.
Experience with Leadite in Jointing Cement-Lined Water Pipe. W. H. Buck.

Medical Times, New York.

XLIV. December.

Bureau of Mines on Occupational Diseases. W. A. Lynott.
A Diphtheria Epidemic in an Industrial School. N. P. Brooks.
Psychologic, Sanitary and Therapeutic Wedges. W. J. Fairfield.

Medical Record, New York.

90. December 2.

The Syphilis Problem Among Confined Criminals. E. N. Boudreau.
Researches in Trichinosis. Wm. Lintz.

December 9.

Diversional Therapy in Mental Disease. A Plan for Its Employment with Special Reference to Social Clubs. L. F. Robinson.

December 23.

The Tuberculin Dispensary. R. C. Newton.
The Bacterial Etiology of Poison-Oak Dermatitis (Rhus Poisoning). L. C. Frost.

December 30.

Sensitized Typhoid Bacteria. A. L. Garbat.
Employment of Persons in the Arrested Stage of Tuberculosis. J. S. Ford.

Modern Hospital, St. Louis.

VII. December.

First Units of the New Buffalo City Hospital. Messrs. Green and Wicks.
Edible Pastes—Macaroni, Spaghetti, Vermicelli, Noodles. J. P. Street.
Plans for a County Tuberculosis Hospital. W. H. Watterson and L. F. Sutton.
What Dispensary Work Should Stand For. Richard C. Cabot.
The Lighting of Hospitals in Great Britain. S. F. Walker.
Care of Alcoholics in a Modern Hospital. C. B. Townes.
For Hospital Standardization. J. G. Bowman.
Hospital Accounting and Finances. A. R. Warner.

New Orleans Medical and Surgical Journal.

69. December.

A Digest of the Insect Transmission of Disease in the Orient with Special Reference to the Experimental Conveyance of Trypanosome Evansi. M. B. Mitzmain.
Observations on Tetanus. L. Sexton.

New York Medical Journal.

CIV. December 16.

Compulsory Health Insurance. E. V. Delphey.

December 23.

The Present Management of the Poliomyelitis Epidemic in New York City. F. Tilney and J. C. Rushmore.
A Case of Leprosy in Connecticut. J. E. Lane.
Food and Efficiency, Vitamine and Inorganic (Salt) Requirements (to be concluded). Martha Tracy.

December 30.

Dental Infections in Systemic Disorders. S. Tousey.
The Fallacy of Fallacies About Tuberculosis. A. Robin.
The Role of Syphilis in the Insane Negro. L. Wender.

New York State Journal of Medicine, New York.

16. December.

The Influence of Luetic Infection in Gynecology and Obstetrics. J. W. Bovee.
Report of a Possible Milk-Borne Epidemic of Infantile Paralysis. J. C. Dingman.
Some Practical Experiences in Medical Inspection in Rural Sections. W. A. Howe.
The Open Air School Child as a Type. Edward Durney.
Health Insurance, Its Relation to Preventive Medicine. B. S. Warren and E. Sydenstricker.

Nurse, Jamestown, N. Y.

V. December.

Nursing in Veneral Diseases II. Gonorrhea. L. Neuwelt.
Industrial Welfare Nursing. Emergency Hospital at the World's Largest Printing Plant. W. Fawcett.
The Visiting Nurse and Her Opportunity. Margaret T. Minogue.

Psychological Clinic, Philadelphia.

X. November 15.

Physical and Mental Factors Involved in the Formboard Test. H. H. Young.
Point Scale Ratings of Ninety-three Dependent Children. C. E. Skinner.

Public Health Journal, Toronto.

VII. December.

Feeble-Mindedness. H. L. Brittain.
Attitude of the Educator towards the Feeble-minded. P. Saniford.
Attitude of the Neighborhood Worker. M. J. Clarke.
Problem of the Feeble-minded from the Institutional Viewpoint. L. W. Brooking.
The Psychiatric Clinic. C. N. Hincks.
General Considerations. C. K. Clarke.
Care of the Feeble-Minded. F. J. Conboy.

Safety Engineering, New York.

XXX. December.

Killed and Injured in Fires in 1916.
Safety for Public Schools. Robert Adamson.
Safety in Southern Cotton Mills. G. D. Bragdon.
Welfare Work. E. E. Bach.
Metal Mine Accidents and Their Prevention. F. W. Sperr.
Street Traffic Regulation in Relation to Public Safety. W. P. Eno.
The Prevention of Accidents. R. C. Richards.
Safety in Bessemer Operations. J. H. Ayres.
Freight Elevators—Their Use and How to Prevent Accidents. J. H. Wright.
Alcohol versus Safety. J. P. Hourigan.
Safety from the Economic Viewpoint. B. F. Day.
Employment, Medical Supervision and Safety. L. A. Phelps.
The Goggle Problem in the Chemical Industry. J. R. de la Torre Bueno.
Health Education. L. G. Shoudy.
Electric Hazards. D. M. Petty.
Possibilities of Public Safety Work. E. C. Spring.
Classification of Hazards in Experience Rating. Arne Fisher.
Eye Protection. F. W. Shepard.

Survey, New York.

XXXVII. December 9.

The Allison Case (Birth Control). J. Prentice Murphy.

December 16.

Social Insurance. A Live Issue. E. T. Devine.
Democratizing Social Welfare Efforts. John Melpolder.
The Health of Social Workers. J. J. Weaver.

December 23.

For Women in Industry. Mary Van Kleeck.
Home Economics and Public Health. W. S. Gibbs.
A Country Funeral. W. C. Rucker.

December 30.

Winning the Other Half. National Prohibition a Leading Social Issue. R. A. Woods.
Federal Aid for Consumptives. Would the Kent Bill Help? Gertrude Vaile.
A State Children's Code and Its Enforcement. R. N. Baldwin.
New Year Goals in Social Work.

Southern Medical Journal, Birmingham.

IX. December.

Our Opportunities and Responsibilities. Robert Wilson.
Some Aspects of Southern Mortality. J. A. Hodges.

Texas Medical Journal, Austin.

XXXII. December.

Delinquency from a Psychic Standpoint. Jno. S. Turner.
Mouth Infections and Their Systemic Effect. A. H. Merritt.
Pellagra Forum.

Texas State Journal of Medicine, Ft. Worth.

XII. December.

Paratyphoid Infection. J. W. Whitman.
The Whole-Time County Health Officer. P. W. Corrington.
Medical Inspection of School Children. C. E. Durham.
Some Essentials in Management of Tuberculosis Patients. C. M. Hendricks.
Vaccines and Respiratory Diseases. B. F. Stout.

U. S. Public Health Reports, Washington, D. C.

31. December 1.

Relationship of Milk Supplies to Typhoid Fever. W. H. Frost.

December 8.

Poliomyelitis—The Recent Epidemic in Newark, N. J. C. H. Lavinder.
Case Fatality in Typhoid Fever. A. W. Freeman.

December 15.

Anthrax. W. H. Brown.
Parinauds Conjunctivitis—Its Importance to the Health Officer. G. L. Collins.

December 29.

Public Health Administration in Colorado. Carroll Fox.

FOREIGN.

Medical Officer, London.

XVI. November 18.

Venereal Disease Schemes.
Maternity and Child Welfare. Harold Kerr.

November 25.

The Germ of Scarlet Fever.
Smallpox and Vaccination at Calcutta. H. M. Crake.
Maternity and Child Welfare (Concluded). Harold Kerr.

December 2.

War-Time Incidence of Cerebro-Spinal Meningitis.
Tuberculosis in Children. E. H. R. Harries.
Control of Venereal Disease in London.
War and the Incidence of Insanity. Wm. Graham.

December 18.

Tuberculosis Campaign in Wales.
The Relations of Municipal and Voluntary Work in Respect of Maternity and Child Welfare Schemes. L. C. Parkes.

Public Health, London.

XXX. November.

Future of Preventive Medicine. John Robertson.
Reviews of Public Health Problems, from the Bacteriological Point of View. I. The Bacteriology of Whooping-Cough in Relation to its Diagnosis, Infectivity, and Treatment. W. G. Savage.
The Coördination of Preventive and Clinical Medicine. A. B. McMaster.
Plans and Description of Scheme for Extracting Oil from Motor Car Wash, Royal Aircraft Park, Farmborough. W. C. Lyons.

December.

War and National Welfare. T. R. Bailey.
Essence of Sanatorium Treatment. J. C. Gilchrist.
After the War. Harold Kerr.

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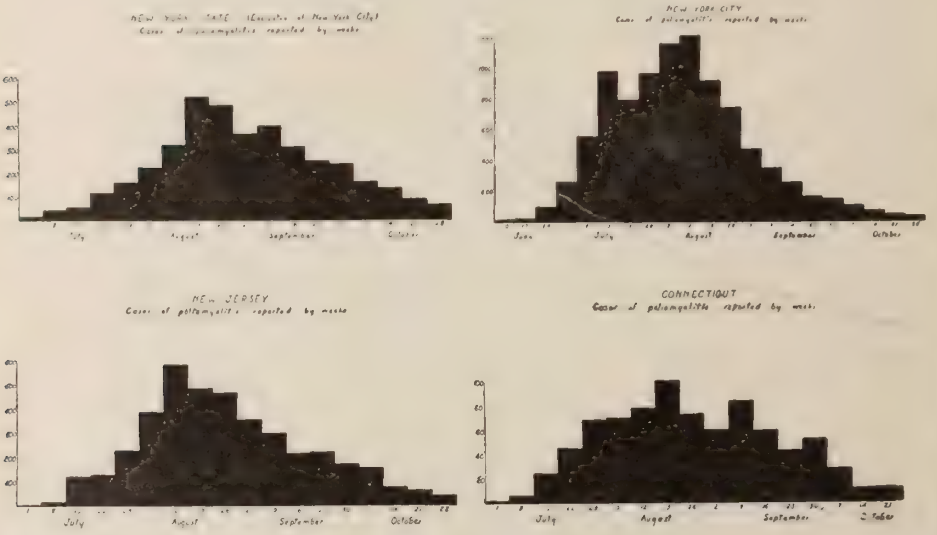
INFANTILE PARALYSIS.

A Round Table Discussion.

At the recent Forty-fourth Annual Meetings of the American Public Health Association, Cincinnati, Ohio, there was held a Round Table Discussion on Infantile Paralysis, in which health authorities throughout the country took part. This discussion was held under the auspices of the Section on Public Health Administration. Dr. George W. Goler, Health Officer of Rochester, N. Y., Chairman of this Section, presided. We take great pleasure in being able to reproduce for readers of the Journal what took place at this most important session.

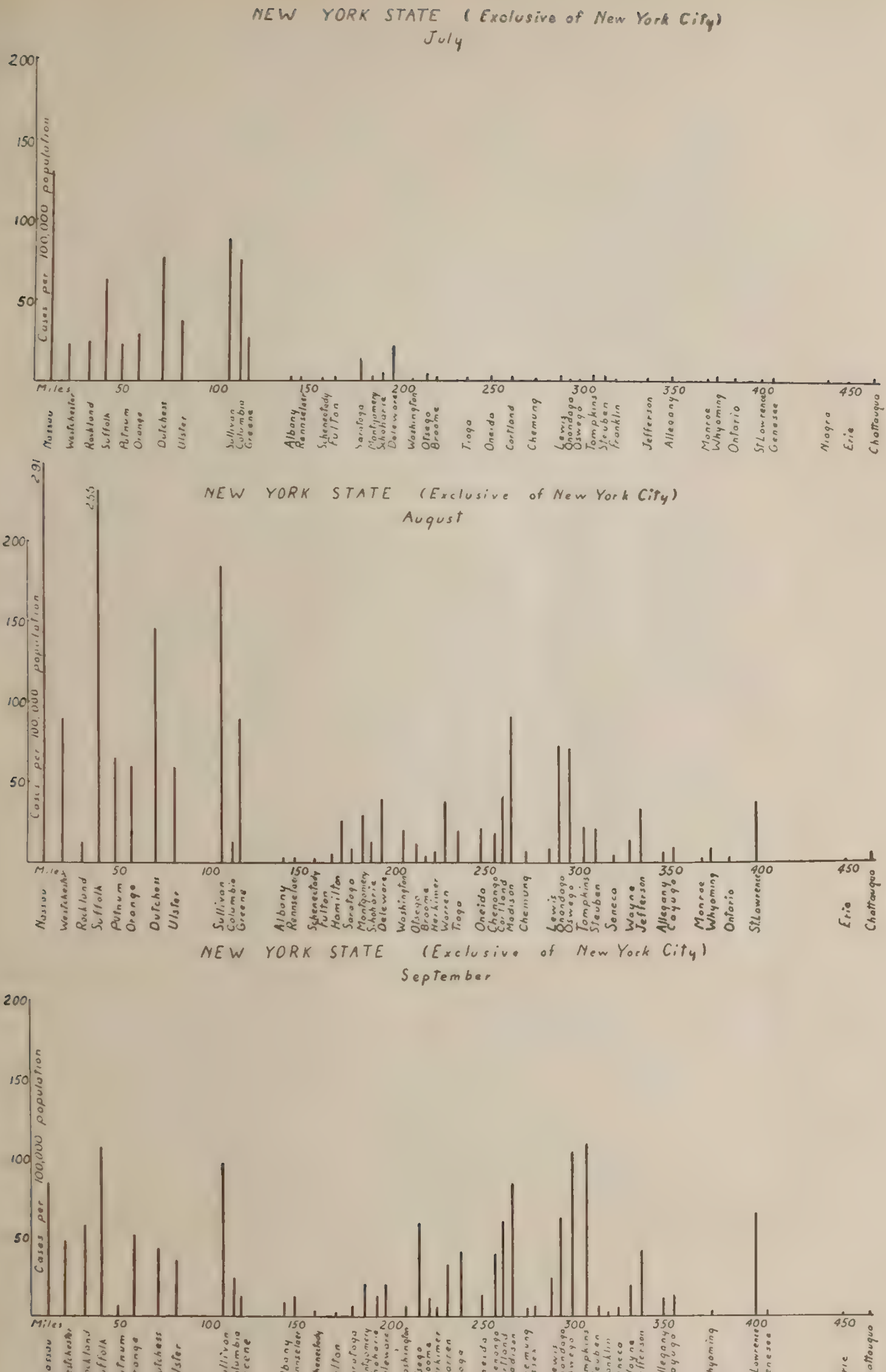
Prof. C.-E. A. Winslow *of New Haven, Conn.*: Mr. Chairman, ladies and gentlemen: Doctor Goler was, I think, actuated by a certain sardonic humor when he put down for this subject, the *Control* of Communicable Diseases, especially *Infantile Paralysis.* I concluded that I must either talk about e control of contagious diseases or out infantile paralysis, and I con- ded that I would select the latter bject, merely taking advantage of the first position on the program to p [illegible]d a few problems for those who e later to solve, on the principle that a fool can ask many questions that a wise man cannot answer. There are two problems in the main that concern us. I think the first is: Why some people have infantile paralysis? and the second is: Why other people do not? The first question is comparatively easy to answer. I think if one studies the map of the prevalence of disease this summer, such maps, for instance, as these that I will pass around, showing the spread of the disease in the immediate vicinity of New York City and further out from New York City, along the routes of travel, not along the rivers except when they happened to coincide with the routes of travel, only reaching the further points in September,—when you take those results and plot them as has been done here, according to the distance in miles from Brooklyn, there is clearly a direct relation, almost a quantitative relation between the case rate and the distance from the original focus. By August the disease is beginning to appear further on, but the relationship still holds. By September the wave has passed to the outlying portions of the area and has left those regions near Brooklyn behind—exactly the phenomenon of every more or less acute contagious disease, spreading in a wave from a center where it started, not preferring the country or the city, as has been claimed in the past. In this outbreak, New York City and Newark had very high prevalences, while in the other states, the country districts showed a slight excess. It seems to me clear that nothing but the communication of a rather virulent virus and communication in the main by human contact can account for any such spread.

Our second question is a much more difficult one. Why is it that only about 1 per cent. of the children in any community get the disease? There are several explanations. One is, that these few are all that are susceptible at that time. This is certainly a part of the truth; yet I do not believe it can be reasonably maintained that every individual in New York City had the germ and every susceptible individual took it. If so, why was there so much more disease in Brooklyn than in Manhattan? Again, the explanation of insusceptibility will not hold with regard to the latter end of these curves. It is true that in New York City the disease fell off a little earlier than in

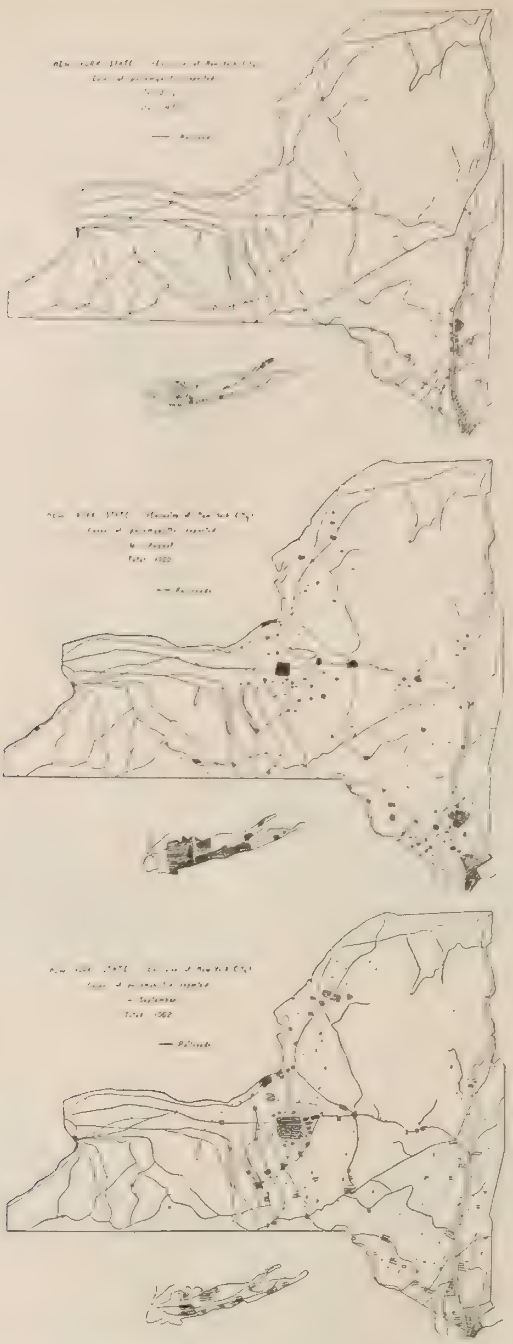


Weekly prevalence of Poliomyelitis in four population groups showing the rapid decrease wi onset of cool weather.

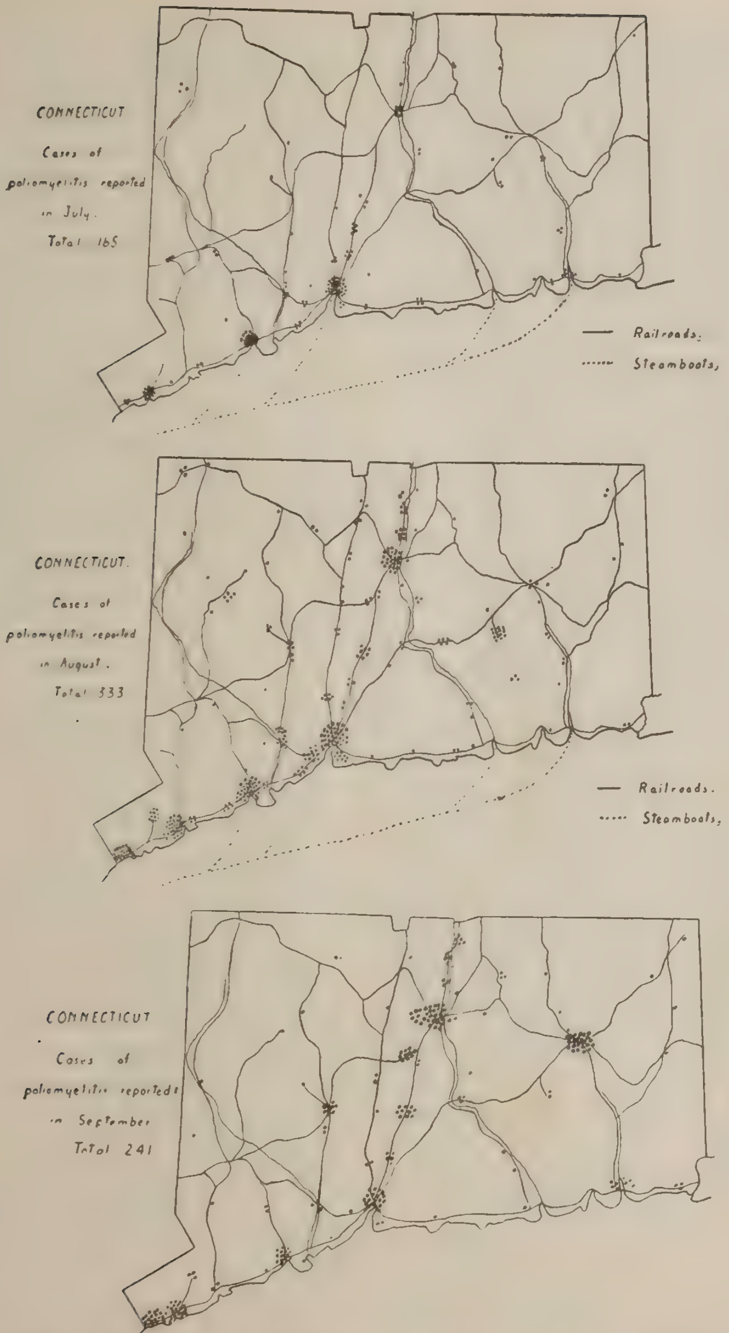
Charts prepared by T. G. Hull of the Department of Public Health, American Museum of Natural History, New York.



Relation between incidence of Poliomyelitis by New York counties and distance from Brooklyn, showing gradual spread from original focus and burning out of susceptible material in localities first attacked.



Distribution of Poliomyelitis in New York state by months, showing gradual spread from New York focus along lines of transportation.


CONNECTICUT
Cases of poliomyelitis reported in July.
Total 165
Railroads.
Steamboats,
CONNECTICUT.
Cases of poliomyelitis reported in August.
Total 333
Railroads.
Steamboats,
CONNECTICUT
Cases of poliomyelitis reported in September
Total 241

Distribution of Poliomyelitis in Connecticut by months, showing gradual spread from New York focus along lines of transportation.

any other places, and I do not doubt that in certain districts of New York all the susceptible individuals had it, but the decrease at the end of the season in the city and in New York State and still more in other states not shown here, like Massachusetts, was certainly not due to the exhaustion of susceptible material but to another phenomenon to which I want to call your attention, the influence of season. It is well known that there have been occasional outbreaks of infantile paralysis in the winter; yet, in general, it is a summer disease. That is the one point I want to lay before you; we all know it, but we do not all take account of it. All the other phenomena of this disease, as far as I know, are explained by direct contact just like that which occurs in any other respiratory disease, coupled with the existence of a large proportion of immunes. What is not explained is the fact of summer prevalence; for all the other nose and throat diseases are winter diseases. I think we ought to remember this one fact which does not fit in with the general scheme of things. Whether it means that the infection is carried by insects, which personally I doubt, or that it is primarily an intestinal infection, or that the germ requires a concurrent intestinal infection, I do not know; one of these three explanations seems to me required to account for the fact of its summer prevalence.

Dr. Frederick L. Hoffman, *of Newark, N. J.:* Chairman, Ladies and Gentlemen: It seems to me that it would have been much better if Professor Winslow had continued his exceedingly interesting and instructive account of his recent research work in infantile paralysis. He has probably given more time and thought to the elementary general questions involved in the strictly scientific study of infantile paralysis, with special references to statistical considerations, than any one else present. The material available for such a study is much more extensive than is assumed to be the case. Unfortunately the statistical data are frequently of doubtful intrinsic value, and far-reaching conclusions are often advanced by those not sufficiently trained in the methods of statistical analysis. There is a serious danger of misleading the public on the one hand and by giving currency to erroneous statistical conclusions through the text-books on infantile paralysis, with most of which I am reasonably familiar, and all of which fall decidedly short as regards an adequate statistical presentation of the facts. The error lies as much in the direction of conclusions from too limited a number of cases as in arguments advanced in the form of a broad generalization based upon a mere collection of heterogeneous data. It seems to me also that the blanks and forms which are being used in connection with the statistical investigation of the recent epidemic fall short of the required consideration of many important matters of detail. The blanks have apparently been prepared with reference rather to a particular point of view than with a due regard to broad considerations of impartial statistical analysis. Crude statistical investigations are certain to mislead the public and seriously hinder the cause of scientific research. It seems to me, therefore, of the utmost importance that there should be a consensus of qualified expert opinion as to the methods of statistical research in infantile paralysis in much the same manner as there is a consensus of qualified opinion behind methods of medical research. If it were easy to arrive at definite conclusions, it is a safe assumption that the results of past statistical investigations would have been more useful than has actually been the case. Infantile paralysis is, broadly speaking, a new disease and the etiological factors are apparently exceedingly obscure. Elementary statisical considerations, such as age, sex, race, season, etc., are in all probability of minor importance, except in so far that, as a general rule, the average majority of the cases and deaths occur during the first five years of life. Even this statement is open to the objection that in some epidemics (in Scandinavia) the majority of the cases and deaths have been among adults. Unquestionably, however, an extended statistical analysis of the experience which has thus far been had in epidemics of infantile paralysis throughout the world, would aid materially in behalf of an effort to arrive at some safe and sane conclusions regarding the extensive epidemic of the present year. It is sincerely to be hoped, therefore, that those who have official charge of the data, whether federal, state, or municipal, will approach the problem of statistical analysis with a due consideration of the extreme complexity of the problem so that the best results may be secured, and that some new light may be forthcoming regarding this lamentable affliction of childhood, which in its ultimate effects has proved a most serious physical and economic burden to the people of this country.

Dr. Charles Bolduan *of New York City:* When the disease first made its appearance in the city, two courses were open to the Department of Health; we could either have kept quiet about it and tried to control it by the ordinary measures (notification, isolation and quarantine), or we could give the matter wide publicity and seek in that way to accomplish a number of things, impossible to attain under the other plans. Thus through publicity we could hope to discover practically all of the cases, a matter of the utmost importance in the control of all epidemics. Besides this, and equally important, we could hope to educate the people so that they might observe the precautions which seemed to be indicated. The result has amply vindicated the publicity method followed by the Department of Health of the City of New York.

Let me call your attention to just one phase of our experience. In the beginning of the year, as perhaps a great many of you know, New York City experienced an epidemic of a griplike infection which caused at least two thousand deaths that we had not counted on. Added to this we have the present outbreak of poliomyelitis which has caused even more than two thousand deaths which were unexpected. Despite these four thousand unexpected deaths in New York City this year, our death-rate thus far is as low as it was last year, and last year New York City had the lowest death-rate in its history. An analysis of the death returns shows that the four thousand unexpected deaths have been compensated by a diminished rate, during the past summer, of deaths from *preventable diseases.* This fact is very significant and shows that something has been at work to give us that favorable result.

To my mind, we see here the effect of public health education. Never before has the city been so thoroughly cleaned up. The city authorities were very active; the streets were flushed daily, garbage and rubbish were promptly collected, tenements were inspected, additional medical inspectors and nurses were provided, hospital and ambulance facilities extended and funds placed at the disposal of the health authorities. All of this had the hearty support of the people of the city, support gained almost entirely as the result of the publicity campaign carried on by the Department of Health.

The people themselves did their share, and willingly obeyed the orders and suggestions of the authorities. The children have never before been so carefully watched over by their parents; never before have the parents been so mindful of the proper care of food and drink; never before have homes been kept so clean.

In closing I desire to say a word about the work of the newspapers of this city. Although we employed all the various methods of spreading our educational publicity — newspapers, leaflets, illustrated lectures, noonday talks, movies and other kinds of devices—it seems to me that the main credit for the good showing to which I have alluded, belongs to the newspapers. They have given us unqualified support, and devoted enormous space to our bulletins. For this invaluable help they deserve our public acknowledgment and thanks.

While it is extremely doubtful that the publicity had any direct effect on the course of the epidemic, there can be no question as to the enormous indirect value of the educational campaign thus carried on. The result reminds one of the old German fable of the dying vintner who told his sons of the treasure buried in the vineyard. Spading and raking every foot of the vineyard without finding the gold they thought was buried there, and about to conclude that their father had been mistaken, they were rewarded by an unusually bountiful yield of the vineyard. This, then, was the treasure, the reward for their careful cultivation of the vineyard.

Dr. Charles V. Craster, *of Newark, N. J.:* The City of Newark, N. J. is in the favorable position of being next to the largest city in the United States. On this occasion, with regard to poliomyelitis, we had not much satisfaction in having that position so clearly related. The question of the possibility of poliomyelitis spreading from New York to Newark was one which had been in our minds since the time that the disease became epidemic in that city in the latter part of June. I think there are quite a number of us who did not quite believe the statement of Wiekman as to the probability of this disease being of a communicable nature; I think now, however, that since our recent visitation we have come considerably to believe that Wiekman was right after all. We had our first case of poliomyelitis of the epidemic type in the first week in July. This was the time at which it had become very prevalent through all the Boroughs of New York City. What brought home to us the fact that this epidemic form had arrived in the City of Newark was that the case was fatal within twenty-four hours. We had had of the endemic type of the disease, previous to that, 102 cases in six years, with only one death, so that we were quite sure that the virulent Brooklyn variety had arrived on the third day of July. It is interesting to refer to the conditions found in this first case, although I do not want to say that it has any bearing upon the communicability of the disease. Upon investigation it was found that the father of this child, which was, by the way a nursing baby, was an express driver who carried goods between Newark and Brooklyn and New York, and brought goods back again from Brooklyn to Newark. The family of this man had never been in Brooklyn or New York City and he had had no visitors at all from that locality. The family consisted of six children, I think. The nursing baby was the first attacked. The disease rapidly spread to the various other wards of the city so that in three months we had 1,360 cases, and 363 deaths. The ward in which the first case appeared was one in which there was quite a polyglot community of Italians, Poles, Hebrews, and a smattering of Germans. These people carried on the business of junk dealers and small storekeepers and there were some small factories in the locality. The cases rapidly spread from the tenth ward, where it originated, into the third ward, and there is something interesting about this, because, talking about sanitary precautions, the third ward in the City of Newark was one in which we had taken special pains to clean up three months previously. I should say that the third ward at that time was possibly one of our cleanest wards, amongst those in which the population is congested and there are present many varieties of racial and religious practices and ways of living. Yet we had the greatest incidence of disease in that ward and the greatest number of deaths. I would say that we had 972 cases treated in the two hospitals in the county hospital, and in the city hospital. In these hospitals very many children suffering from other diseases were treated and yet we had not a single case where we could say an infection occurred from an infected to a well child.

Dr. Louis I. Dublin, *of New York City:* In investigating the etiology of an obscure disease, workers often get useful suggestions from its analogies to other and better known diseases.

It may be of value, therefore, to point out some of the resemblances which the epidemiology of poliomyelitis bears to that of other diseases of childhood. The periodicity in the epidemics of poliomyelitis recalls that of scarlet fever. The disease is not epidemic every year; it is only fairly prevalent for a number of years and then suddenly reappears in epidemic form. The similarity to scarlet fever, cannot be carried too far.

The varying virulence of the disease suggests the history of smallpox in America. For a period of years smallpox will be prevalent over wide areas of the country in decidedly non-virulent form; the lethal rate may be as low as .1 per cent. Then suddenly a focus of infection may develop where the lethal rate will be as high as 35 per cent. You will recall epidemics of this sort in Michigan and in Florida, a few years ago. Something like this is true for poliomyelitis this year unless our earlier figures for this disease are entirely untrustworthy. Previous records indicate a lethal rate of about 10 per cent. During this year's epidemic, the lethal rate varied slightly in different communities but averaged more than 20 per cent. In Newark, N. J., and in New York City, the lethality was as high as 27 per cent. For a while, the figures for the state, exclusive of New York City, seemed to be running much lower, but the corrected figures show a rate similar to that of the city. This makes the picture a little more consistent, since the cases in both the city and the rest of the state started from the same focus, attacked the same ages of the community, and received about the same kind of medical care.

Another interesting analogy with the infectious diseases of childhood is the fact that poliomyelitis shows a consistently higher mortality among males than among females. The New York City figures for this summer's epidemic show that 58.1 per cent. of the deaths were of males and 41. 8 per cent. of females. In Newark there was an even greater preponderance of the deaths among male children; 61.2 per cent. as against 38.8 per cent. for females. Here the lethal rates exhibit the same difference, being 28.1 per cent. for males and only 24.7 per cent. for females.

Poliomyelitis is again similar to other childhood diseases, such as measles, scarlet fever and diphtheria in regard to its incidence by color. There seems to be a high degree of immunity among colored children to all of these infections. Whether or not this is because poliomyelitis has not as yet been prevalent in those sections of the country where there are extensive colored populations, we cannot definitely say. But, for the first three months of New York City's epidemic, the proportion of colored cases was almost negligible—22 of the total of 1,922.

I did not know the significance of these similarities between poliomyelitis and infectious diseases of childhood. They may suggest a line of approach in the researches of the laboratory worker and of the epidemiologist which may help to clear up some of the obscurities of this disease.

Dr. Haven Emerson, *of New York City:* We should say that we have accomplished one or two very definite things; we have accomplished the teaching of physicians, the practitioners of medicine, that this is a general disease which may express itself without paralysis; otherwise we should not have had 15 per cent. of all our cases showing no paralysis at any time. We have accomplished this change in the public state of mind, that whereas, in the beginning of the epidemic, the Department of Health was sued by people because we took children from them to hospitals for isolation, we have, during the last weeks of the epidemic, been sued because we did not take children from people's homes and put them into hospitals. That is a result of the psychological treatment of the community by public education, we believe. We should say that we have, to our own satisfaction locally arrived at the conclusion that environment, so far as it is ordinarily understood, in the form of civic cleanliness, in the maintenance of standards of upkeep of premises, has no obvious or necessary causal relationship to the spread of the disease. Our reason for so believing is that the disease has been common in places which would score A on sanitary environment, and there has been no case on Barren Island, in the City of New York. Barren Island is a community isolated by water from the Borough of Brooklyn, but within the confines of the Borough, where there are 1,700 people and about 500 children, in a place with no water supply except shallow wells, no sewage disposal, no garbage collection, and the presence on that Island of all the city garbage brought there for rendering, all the dead animals of the city brought there for reducing to their ultimate end products and no protection against flies, insects or other carriers of any kind; the most unpromising and insanitary conditions to be found within the limits of the city prevail on Barren Island and always have. That place is socially and geographically isolated and has not been cleaned up. Governor's Island has been isolated by the Federal authorities. We believe that the segregation of children under such conditions of care as prevail in well regulated institutions for children is sufficient to prevent the spread of disease to those institutions from the community or in those institutions among the inmates when it occurs among the children. We had ten cases supposed to have occurred in institutions for children among 30,000 such children in the City of New York. Of those, all but four occurred in institutions which received children direct from the tenements, kept them a couple of weeks and returned them, so those cases may be set aside as not being under the control maintained in permanent homes for children. There were four cases occurring in institutions that had children for permanent residence; all four occurred within three weeks of the time of our putting the quarantine upon those institutions. The infection might conceivably have occurred before we shut those institutions off from contact with the rest of the community. We did prevent the entrance of adults and children as visitors to those institutions from the first of July. Three of those cases developed in one institution in which they took the children out each day to play in Prospect Park, and in that same institution visitors broke in through the rear door for the sake of seeing their children after the quarantine was established. Those four cases in those two institutions of all the 100 institutions for children in the City of New York, are the only instances of the occurrence of this disease in a fixed child population of 21,000 children, and the only measure of protection was their isolation from contact with the rest of the general community; there was no protection by precautions concerning water, milk, foods or general screening against insects of any kind. We felt in the beginning of this epidemic that just as soon as we got reports of the first handful of cases with a high death-rate, we owed as much or more to our neighbors whom we could not protect as we did to ourselves, whatever methods of protection we wished to put into force; that was why the first act of the Department was to notify the health officers of adjacent states, and the surgeon general of the Public Health Service and get as wide a knowledge of the existing and threatening epidemic as possible through the official channels of public health administrators. When that was done we had to say "We do not know how we can protect ourselves; we are equally powerless in attempting to protect you and we must expect you to take whatever precautions you wish against us. We cannot immobilize the traffic or the business of the City of New York."

Dr. Allen W. Freeman, *United States Public Health Service:* With reference to the question of humility in the study of poliomyelitis, I do not think there is any disease which leads so much to an humble and contrite frame of mind as does poliomyelitis. I do not think you will find any one of the very many men who were engaged in the study of the disease in New York this summer who will lay claim to knowing any single fact about the disease other than the fact that it did prevail.

I do not know whether my friend Doctor Hoffman was referring to me in his remarks or not, but as I happen to be in custody of a considerable body of the statistical matter on the epidemic, I want to assure Doctor Hoffman that these statistics will be compiled with such honesty as we know, and we trust with as much honesty as if they were compiled in an insurance office.

Now as to the fundamental principles underlying the study of poliomyelitis, there is very little regarding which we can speak with certainty. It seems to me that the fundamental truth which it is most important to determine at this time is, Where is the reservoir from which the virus of poliomyelitis comes?

Any one who studies the disease is at once struck with the fact that the spread of the disease over any considerable territory is accomplished in a comparatively short space of time. In the states about New York during the past summer, while the epidemic began in New York City about the 15th of June, it began in New Jersey about the 24th of June, and reached its crest only a week later than in New York City. New York State reached its crest just a week later than New Jersey, and Connecticut the same week as New York State. In studying the incidence of the disease in a neighborhood or community also, the cases tend very markedly to appear almost simultaneously, and the disease passes over in a very short period of time. The appearance of the disease in the city of Bridgeport, for example, was very striking, in that practically every part of the city was invaded at once.

Such facts as these, and they will be found to be quite general in their application, lead one to believe that he is dealing not with the links in a chain of infection, but with the outcropping of some very extensive and general underlying reservoir of infection, of which the paralyzed case represents only the peak of virulence.

The fact of prime importance at this time, therefore, is to locate this reservoir of infection. Once the reservoir is located, the means of transmission will be comparatively easy to determine. If this reservoir is in man, the means of transmission are limited to a few possibilities, if in some animal in association with man, to a few others, and if, as may be entirely possible, in some now altogether unsuspected place, to a single possibility.

Any one working with poliomyelitis must be struck with the indications pointing to the intestinal origin of the infection. The prevalence of the disease reminds one strikingly of the prevalence of so-called contact typhoid.

To my mind, therefore, the most important problem in poliomyelitis, and the one on which all other work must wait, is the definite and positive determination by laboratory means, of the location of the reservoir of infection.

Dr. W. H. Frost, *United States Public Health Service, Cincinnati:* Doctor Freeman has undertaken to show the necessity for assuming a huge reservoir of infection of poliomyelitis and raised the pertinent question whether or not this is a human reservoir. I think the answer comes primarily from the experimental evidence which all points to an exclusively human reservoir, to the idea that this is an exclusively human disease. An idea was advanced some years ago by the first man who ever studied this disease broadly, that it is not rare but a wide-spread infection only occasionally manifesting itself in paralytic cases. Without undertaking to argue to that conclusion, I merely want to present the observations upon which the hypothesis is based, which are these; First, that we have and have had for many years evidences of the endemic occurrence of poliomyelitis over a widespread area, the cases showing no apparent connection one with the other. The second is the fact, now well established, that poliomyelitis is not necessarily a paralytic disease. We frequently see cases which can be diagnosed with great care, but which would undoubtedly be overlooked except in the presence of an epidemic. We next note the phenomenon of self-limitation of epidemics. We see an epidemic sharply decline in a community where only one out of a thousand are attacked. This is difficult to account for on any idea except that the infection has burnt itself out. We have also noticed in several instances, an apparent immunity of areas which had suffered from previous epidemics. This was noted in Sweden in 1905 and 1911; also this year in the United States. Then, again, the age distribution of cases, their limitation largely to children is significant. Certain other infectious diseases, notably measles, are largely limited to children, not because they are essentially children's diseases, but because the adult population has been more or less immunized. Then we have the fact that epidemics characteristically reach a higher rate of prevalence in rural than in metropolitan communities, and farther, a very striking fact, not sufficiently emphasized, that the rural cases tend to an entirely different age distribution from the metropolitan cases. Studies of statistics of such epidemics as are now available show that in rural epidemics, especially those in Iowa and Minnesota, a much larger proportion of cases have been in the higher age groups than has been the case in the epidemics occurring in large cities. I present this idea, not as a conclusion, but as a suggestion which deserves a far broader study than has been yet possible to make. Doctor Hoffman has justly said that our statistics up to this time are extremely deficient; we have records of only a few thousand cases prior to this year; this year we have records of over 20,000 cases, which should afford us a much broader statistical basis. In this connection I may say that in undertaking to draw conclusions from analogy, we are very often handicapped by the lack of parallel data, carefully worked out, regarding our most common infectious diseases of better established etiology, so that we often assume concerning them certain epidemiologic features which statistical analysis would not necessarily show to be true and are thus led to false analogies.

Dr. John S. Fulton, *of Baltimore:* About fifteen years ago I wrote a paper entitled "Quarantine; the Delirium Ferox of American Hygiene." Under the name *delirium ferox*, the older writers described a psychosis, sometimes occurring during the initial fever of smallpox; a violent insanity, dangerous to the victim and to life and property about him. Being free and unembarrassed by practical knowledge of quarantine and its psychosis, I spoke disrespectfully of these antiquities. In 1916 I have suffered retribution. Quarantine and its psychosis have overtaken me.

Up to 1916, we in this latitude knew nothing whatever about interstate quarantine except what we could learn from accounts of its practice in the Gulf States during epidemics of yellow fever. It was a procedure beginning as a kind of gentlemanly espionage by the health officials of several states over the sanitary affairs of other states, concentrating presently in one city, where a fine punctilio was exercised in asking and answering questions about yellow fever, and eventuating in quite vigorous hostilities when epidemic conditions were at last manifest.

We used to think that such things could not occur in our cooler ranges of the North Temperate Zone. But in 1916 we did no better than our Southern brothers. Our "manners had not that repose which marks the caste of Vere de Vere," but we got there just the same.

When I first heard that Maryland would be involved in a state-wide quarantine, I made the news welcome. Up to that time the quarantines had simply spread from town to town, incoherent, contradictory, chaotic quarantines of every grade. But with state-wide quarantine, I thought we might have an experience massive enough to determine the disappearance forever of such a procedure. And so about the 5th of August, when I learned that all Maryland had been quarantined against, I became somewhat exhilarated.

My period of exhilaration was extremely brief. I had no idea what was impending. I was stone blind to what should have been perfectly obvious. There had been fewer than twenty cases in all Maryland up to that time. We had been certifying a good many people for travel to other states; most of them Marylanders, not afraid to go with their children to their usual summer quarters farther north. But now we began to certify people in great numbers, and in all parts of the state. We ticketed the traveling public with the evidence that their journey began in a quarantined state. These printed and signed official acknowledgments were in view at railway stations and wharves, and health offices were besieged by applicants for these inculpating documents, necessary to travelers.

Now imagine, if you can, a health authority managing a great spectacle of disaster, and at the same time giving comfortable assurances to the people. The people did not discredit us on either hand. They believed in the spectacle and in the figures too. They were not concerned with the actual numbers, but with the significance of the numbers. Whether the cases of poliomyelitis were tens, hundreds or thousands, they meant that we were on the verge, or in the grip, of epidemic poliomyelitis. We had no maniacal panic, but a widespread misinformed and very embarrassing fear. We began to pattern our actions, slavishly, on bad models. Our Baltimore outbreak was measured by days, quite as if we had a huge population like that of Greater New York. One morning a newspaper came out with the headline, "Only One Case, The End in Sight." Next morning, the headline said, "Three New Cases, Hope is Crushed." During several weeks our official behavior was pretty much like that of the more excited states. Trains and boats were inspected. We dispossessed travelers of their certificates and permits. We allowed the opening of the public schools to be delayed, and went beyond necessity in several other matters. We did not command our situation. We were largely dispossessed of command, partly by the unreasonable and, to my mind, absurd requirements of quarantining states, partly by the popular counsel within our own border.

There was not a single point, of importance to an executive health officer, secured by the interstate quarantine, which could not have been better, more cheaply, and more speedily secured by the simple notification which was given by the United States Public Health Service from New York City and Baltimore to all parts of the United States. Interstate quarantine as exemplified in 1916 against poliomyelitis was not a helpful but a disabling procedure. From our 1916 experience one benefit ought to result; the relegation of interstate and interurban quarantine to the medieval limbo out of which it came.

Robert N. Hoyt, *of Manchester, N. H.:* The city or state which wishes to control poliomyelitis may find an authoritative outline of methods in a recent number of the *Bulletin* of the United States Public Health Service. For the control of diphtheria, scarlet fever, typhoid fever and other communicable diseases, we have no similar authority. The efficacy of the prescribed rules for poliomyelitis may be doubted. About the value of similar rules for the other diseases named, there can be no doubt. Neither can there be doubt as to the needs of scientific leadership to those who know the backwardness of city and state health departments to apply proved scientific discovery to their regulations. Some cities and states still base release of scarlet fever patients merely on time and desquamation and not on abnormal discharges. Similar unscientific practice in the universal fundamentals are common among the many city and state health departments which are guided by fear of the medical profession, or of the public. The remedy which I propose for this bondage to the superstition and discarded theories of a prescientific age is scientific leadership to be obtained by the report of a committee of experts appointed by the chairman of this section; it is my idea that this committee shall concern itself and report only on the universal fundamentals. I therefore propose the following motion:

That the chairman of the section of public health administration appoint a committee of five to formulate minimum requirements for the control of the common communicable diseases and that this committee be instructed to report at the next meeting of the Association.

Mr. Hoyt's motion was seconded and carried.

Dr. F. M. Meader, *of Albany, N. Y.:* When I said that I would speak on this occasion, it was understood that I was to talk on another subject. There has been one or two suggestions made which I would like to follow up first, that which was made by Professor Winslow, speaking of the seasonal prevalence of the diseases of measles and scarlet fever. The occurrence of these diseases is greatest in April and March, respectively. The occurrence of diphtheria is greatest in the early part of the year. The greatest appearance is in the last part of the year for typhoid fever. The peak of poliomyelitis has been in September in years past. This year, in our section, it was in August. Now that corresponds with the peak of typhoid fever; that is, typhoid fever, in our section of the country, comes heaviest in August and September. Doctor Freeman pointed out that the infectious agent might be prominent in the intestinal discharges of the poliomyelitis patient. There are a number of men who have been examining this subject carefully and they have the feeling that in this outbreak observation, on the possibility of the infectious agent being distributed by aloine discharges, has been largely neglected.

In regard to quarantine, we have had two very striking examples in New York State; one city of about 100,000 people has had a very rigid system of quarantine; they started by making a house-to-house canvass for all the newcomers in the city; they posted guards at the entrance to the city, at the railway stations and at the trolley entrances of the city, where every trolley car came to the city a policeman entered the car and took off the children and found out where they were going. Every child that entered the city to remain was quarantined for two weeks. The system was carried out in a vigorous manner. A neighboring city with practically the same population did just the reverse. The health officer was on his guard at all times and whenever a contact case or a case was brought to his attention, he segregated it at once, but there was no widespread attempt to control all of the people in the city. At the close of the season, the first city had six cases, and the last city had eight.

Dr. Maurice Ostheimer, *of Philadelphia:* There was one striking difference between New York and Philadelphia, in the small number of cases without paralysis reported in Philadelphia. The Board of Health of Philadelphia passed a stringent regulation that, in the case of every child with infantile paralysis reported, should the child remain at home, all inmates of the house should be quarantined for a period of thirty days. As the natural result of this regulation, very few cases without paralysis were reported. It follows, therefore, that our percentage of abortive cases is a very low one and our whole mortality a very high one. We had, between January 1 and October 23, 1916, the enormous number of 955 cases of anterior poliomyelitis, and those who are able to estimate consider that there were between 200 and 300 more abortive cases never reported because they did not reach the stage of paralysis. We had, out of the 955 cases, 284 deaths, a mortality of 29.7 per cent. The fact that the abortive cases were not considered in this list helps somewhat to explain this high mortality. There are also two other factors of some importance. When a case died with a "suspicious" diagnosis, the physicians being unable to decide whether the child had infantile paralysis or not, that case was included in our list, so that we undoubtedly have some cases reported as "suspicious deaths" which were not anterior poliomyelitis. Besides, we had a large number of cases of the "bulbar" type, cases which invariably terminated fatally.

There is another thing to add, that, as Philadelphia is in Pennsylvania, we had the benefit of the quarantine regulations imposed by the state of Pennsylvania. On August 4 Doctor Dixon, Commissioner of Health of Pennsylvania, quarantined the State against all children under sixteen years, admitting children from other States only upon the presentation of certificates from the local health boards, from which the children came. As a result of this action, nearby States also declared a quarantine and children were not allowed to leave this State without certificates. Over 200,000 such certificates were written in Philadelphia alone. This quarantine was kept on for sixty days, until October 2, 1916.

Dr. William H. Park, *of New York City:* In the short time allotted, it would seem unwise to repeat what others have said and so I wish to state that all that Doctor Frost and Professor Winslow stated concerning the probability of human carriers and of slightly developed cases being the source of infection, I agree to. Certainly to me, the evidence has appeared as convincing as it did to the two gentlemen who have presented the facts and illustrations.

Those who are not familiar with the difficulties of identifying the organism of poliomyelitis probably wonder why the laboratories have been of so little use in this epidemic except from the diagnostic examination of spinal fluids. In a case of diphtheria, it is very simple to make a throat culture. In the case of cerebro-spinal meningitis, the micro scopic examination of the spinal fluid readily reveals the organism and cultures from the nasal pharyngeal mucus membrane usually readily give cultures, so that the existence of carriers can be detected and the duration of isolation controlled. It is entirely different in poliomyelitis. It can hardly be said that the germ has been identified. The one discovered by Noguchi and Flexner is probably the organism, but there is still some doubt. The streptococcus isolated from throats and tissues by Rosenow is still under discussion as to whether it is the same organism as the one previously mentioned, or another. In my opinion, the streptococcus is not the same organism and cultures from the throat cannot be used for detection of carriers or for persistence of the germs in convalescent cases. At present, our only method of detecting the organisms in the sick, the convalescent or the carrier is to inject monkeys with the washings of the infected mucus membranes or with bits of the infected brain or spinal cord. Even in actual cases, the great majority of washings fail to infect, although we know that the organism must be present. It takes a considerable bit of tissue of the brain for the first inoculation. It seems as though the organism of poliomyelitis was only slightly infectious for monkeys unless it passes through a series of them.

It can be readily seen that laboratories, up to the present time, can be of no help in detection of the individual infected cases and that our experiences, so far, do little more than teach us that the occasional contact person becomes a carrier and that, at least, a few convalescents persist in their infections. It is true that we can deduct from this that many persons are carriers and that many convalescents continue to be infectious for weeks and possibly months. Whether we will be able to get any more accurate information on this point during the epidemic, is doubtful.

Even if we could readily detect the infectious organism, I doubt whether we could do much more at present. When we consider the respiratory diseases, we realize that we control them to only a very slight degree. Pneumococcus infections, diphtheria and cerebro-spinal meningitis, all are spread in spite of our precautions. If only a small proportion of people are susceptible to a disease, but many may become carriers of infection, it becomes an extremely difficult matter to control the spread of disease, because we cannot separate the infected from the uninfected and, up to the present time at least, we are not willing to isolate whole families and communities.

Dr. Mosby G. Perrow, *of Lynchburg, Va.:* In Lynchburg this year eighteen cases of poliomyelitis have been reported, one case in July, four cases in August, ten in September and three in October. The opening of schools was postponed for two weeks, from September 11 to September 25 on account of the scare. All the cases with two exceptions were under five years of age and twelve of the eighteen were under two. The cases were widely scattered and distributed apparently without regard to sanitary conditions. No single family in the city had more than one case nor did any of the 158 contacts quarantined for two weeks ever develop symptoms. We could get no contact history whatever, but two children living fourteen blocks apart were taken sick simultaneously four days after playing together on August 27. A third child living in the country who also played with them on that date was reported a case at the same time, by the county authorities. These could hardly be called contact cases but it would seem that the three got the infection from the same source. My own view at present from a limited experience is that the contagion is slight. Were poliomyelitis contagious like measles, or smallpox, or whooping-cough, it would almost certainly have swept the entire city. The opening of schools could have had no effect on the spread as only three cases developed after the opening, and all three of these were children under three years old. If it is spread by contact, it has a rather odd way of proceeding.

Dr. Luther M. Powers, *of Los Angeles, Cal.:* I have nothing to add to this discussion whatever. I wish

I could give my time to someone that knows something about poliomyelitis.

Until 1910 it was not reportable, consequently not quarantined. After that time it was placarded and the same rules of quarantine were enforced as in the case of scarlet fever and diphtheria. The quarantine officers visited the premises to see that the orders were carried out.

In 1912 about 30 miles above the city, in the country, a family was quarantined by the county health officer. There were three cases in that house. Within three weeks, about ten miles from the city, there occurred another case, within the town of Burbank. That was quarantined by the health officer as usual. Some of that family visited another family in a southeasterly direction from the city where they had no quarantine regulations, and no rules were observed in regards to this case. I believe the town of Watts had employed a health officer at one time and paid him $5.00 per month, but discharged him because somebody was dissatisfied. Also the town of Vernon, nearer us still, had no health officer and no regulations were observed. It was an incorporated town and consequently the county health officer did not go in there until I called his attention to the situation. We quarantined three cases on the first visit to this district or town, which did not have over 500 or 1,000 population.

From these two places, Watts and Vernon, the disease crept into the city, and we began to quarantine as usual; that is, we began to placard and our officers visited these houses to enforce our quarantine regulations. The disease rapidly increased. We had in June, 19 cases, and in July the disease increased so rapidly that I found it necessary to go to the then acting mayor and asked him that we have a committee of citizens to coöperate with us because we found there was a certain element in the town that desired to break up any restriction or regulation in regard to this or any other disease. A meeting was called, and ministers, physicians, and various other citizens met with us, and after due consideration an advisory committee was appointed.

We went before the city council and asked for help and the authority to employ guards and physicians; the physicians to inspect from house to house and care for those who were in quarantine; the guards to quarantine the houses during the whole twenty-four hours.

We also started to clean up the alleys and out-of-the-way streets, having the same sprinkled down; and prohibited children under 15 years of age from visiting picture shows, theaters, picnics, or any other crowds.

This action was taken about the beginning of the last week in July. The disease rapidly diminished in the course of ten days; and whether it was due to the strict quarantine or a combination of all the measures, I am unable to say. Anyway, the parties who were willing to fight us prior to that were satisfied they had not accomplished much and were willing to concede that the disease had been brought under control by the methods established.

By the second week in August it had rapidly decreased, and in September we had only 11 cases. In all we had 261 cases and 52 deaths during the epidemic.

In thirteen instances there was more than one frank case in the family, and I know that on more than one occasion, in fact on several occasions, I could directly trace the disease from one party to another where they had been visiting; particularly in the family of a physician who had two cases in his house. He thought he had carried the disease home from making an autopsy. After this doctor reported his children we succeeded in getting a report, through one of our inspectors, of a family which had not reported the instance of the disease, and the children of his family had been visiting the doctor's family a few days before the children were taken sick. The first family had been sick for ten days or more before we received the information.

Notwithstanding the fact that I know you get a very poor history of any contagious disease from parties affected, I desire to state that I have lived in the city and country and have learned that you get more definite and correct information regarding the source of infection from the country districts than the city, for the residents in the country do not communicate with one another so frequently and consequently remember the instances.

Dr. J. F. Anderson, *of New Brunswick, N. J.:* There is just one point I would like to refer to, which, however, has been mentioned incidentally by some of the previous speakers. It has been suggested by some of the speakers that it is necessary to assign some unusual reason why infantile paralysis is largely confined to certain age groups and why such a small proportion of the total population become infected with the disease in such a way as to present clinical evidences thereof.

I have had a fairly large experience with typhus fever, and some with yellow fever, and know that in these two diseases their endemicity is maintained largely by the occurrence of unrecognized cases of the disease among persons of the lower age group in whom these diseases frequently appear in a milder form than in adults. I believe the same thing holds in regard to infantile paralysis, and the fact that the disease appears to be more frequent in certain age groups may be explained by the fact that those in other age groups have become immunized as a result of a slight and previously unrecognized infection.

Dr. Ralph H. Hunt, *of East Orange, N. J.:* We would like to emphasize two points:

First: We believe this to be without question a contagious disease. In our experience it most closely resembled scarlet fever in its epidemiology. The total number of cases observed was 132. Of these there were five instances of two cases in one family, four instances of three cases in one family, and one instance of four cases in one family.

Second: We wish to call attention to the value of the examination of the spinal fluid in the diagnosis. In our opinion it is the truest indication of the disease where the diagnosis cannot be made by the presence of paralysis, in very many of the cases where the diagnosis was made by lumbar puncture before paralysis, it was later confirmed by the appearance of actual paralysis. It was our rule not to make a diagnosis in doubtful cases without lumbar puncture.

Our total number of spinal fluid examinations totalled seventy.

Average cell count for positive cases, 151.

Average cell count in negative cases, 4.

Albumin and globulin were increased in all positive cases.

A good Fehling. There follows detail cell counts:

Over 10 and under 20, two. Over 20 and under 30, two. Over 40 and under 50, five. Over 50 and under 60, seven. Over 70 and under 80, three. Over 80 and under 90, five. Over 100 and under 200, eighteen. Over 200 and under 300, four. Over 300 and under 400, four. Highest counts: 786, 777, and 582.

Dr. W. L. Holt, *of Maplewood, N. J.:* I think I have a remarkable distribution of my cases in families. Doctor Hunt, of East Orange, mentioned one family where there were three cases in the family, but out of the 18 cases we had in South Orange Township, no less than 9, just half, were plural cases, that is, were not individual cases where there was only one case in the family. I had three families where there were two cases in each family, and one where there were three, so it certainly looked as though it might spread in families.

Dr. Maurice Seymour, *of Winnipeg, Sask.:* In a population between 700,000 and 800,000 we had 65 cases with a mortality of 9; 15 of those cases we were able to trace directly to contact with a case that occurred in North Dakota; in the other cases, we were unable to trace any contact of that nature. These 15 we clearly traced to an individual case in North Dakota that the family had been visiting.

Dr. William H. Park, *of New York:* The chemical and microscopical examinations of the spinal fluid give great help in the doubtful cases, but the findings in themselves never give us the information to make the absolute diagnosis of poliomyelitis, although the microscopical search may rule it out by detecting some specific organism as the meningococcus or the tubercle bacillus. Necessarily, during epidemics, the very great majority of all preparalytic cases presenting suspicious symptoms referable to the nervous system, such as hyperesthesia, altered reflexes, stiffness of the neck, etc., are poliomyelitis. The health officer is fully justified in treating these cases as such while waiting for further information such as the development of paralysis or the confirmatory results of the spinal fluid examination. If this is normal in composition we can almost but not absolutely exclude poliomyelitis. If abnormal we note the chemical and the cell content changes. There is no possibility at present of detecting the specific bacteria as in meningococcic and tubercular meningitis. The positive findings, therefore, as previously stated are not pathognomonic. The fluid in a case of poliomyelitis is usually increased in amount and, therefore, escapes from the spinal puncture under pressure. When it is examined in a tube, it is seen to frequently present a ground glass appearance when viewed carefully by transmitted light. This is due to the increased number of cells. This test is not as accurate a measure of the cell increase as the microscopical examination, but is of value at the bedside as helping to separate cases of meningism from the true inflammations. The shaking of the fluid in the tube will usually give a froth due to its increased albuminous content. These two results are not limited to fluids from cases of poliomyelitis as they occur also in some cases of meningococcic and tubercular meningitis having almost clear fluids. If from the spinal puncture a small amount of blood is added to the spinal fluid, a similar condition is obtained. To avoid this the middle portion of the escaping fluid may be examined. In poliomyelitis, there is a more or less marked inflammatory reaction and there is, therefore, a slight to a moderate increase in the cells, the globulin and the albumin.

The cells count is made either by examining the fresh fluid in the glass counting chamber or the centrifuged sediment. The two methods, in our opinion, give similar results. The sediment is also stained for microörganisms. We have not considered the exact number of cells as important, but simply whether the increase was slight, moderate, great or very great. Doctor Neal has not felt that the number of cells has any direct relation to the prognosis although the greatest number of cells are usually found in the most severe cases. We have used in the chemical tests the nitric ring test for albumin, and butyric acid test of Noguchi for globulin. The albumin and globulin amounts always run nearly parallel. The presence of glucose is tested by mixing equal quantities of Fehling's solution and spinal fluid and the reading is made after the lapse of one-half hour. The cells usually show a great preponderance of mononuclears, but in a few instances there is over 50 per cent. of polymorphonuclears. The cells are often so degenerated that it is hard to classify them. The type of cells is of little, if any, prognostic value.

The differential diagnosis in suspected cases is helped by the examination of the spinal fluid as follows:

1. Cases in which the central nervous system is not involved.—The spinal fluid in cases of gastro enteritis is usually normal in appearance, quantity and constituents. In cases of meningism due to pneumonia, etc., the fluid is usually increased in amount, but is otherwise practically normal. Doctor Neal has noticed that in a small percentage of cases of convulsions, and whooping-cough and in some cases just before death there is an increase in the albumin and globulin of the spinal fluid.

2. Cases in which the brain and cord and meninges are involved.—These include rare early cases of epidemic

and older cases of tubercular meningitis. In cerebro-spinal meningitis even in the first 24 to 48 hours in the exceptional cases in which the fluid is not cloudy and the globulin is not excessive one usually finds meningococci and a great excess of polymorphonuclear leucocytes. In meningitis due to streptococci and pneumococci, the bacteria are usually present on first day and almost always at later periods.

The tubercular meningitis give fluids and contained cells most similar to poliomyelitis. The bacilli can usually be found and the history is usually suggestive. In most cases the globulin and cells are in greater amount and the reduction of Fehling's solution is not as great.

The syphilitic cases are suspected through a positive Wassermann.

Dr. H. L. Amoss, *of New York:* I believe that a differential diagnosis should not be made by merely macroscopic examination of the cerebrospinal fluid. The spinal fluid in very early stages of cerebrospinal meningitis may present the ground glass appearance. Even in an epidemic of poliomyelitis one should always bear in mind the possibility of epidemic meningitis in order that specific treatment may be begun immediately. In an epidemic of over 600 cases of poliomyelitis this summer in Westchester County, New York, I discovered two cases of epidemic meningitis and diagnosis was made tentatively at the bedside by microscopical and chemical examination of the spinal fluid. Specific antimeningitis serum was administered immediately so that in the first case only three doses of serum were necessary and in the second case only two doses were necessary to bring about recovery. The diagnosis was confirmed by centrifuging the fluid and staining the sediment.

I should like to emphasize the importance of examining the spinal fluid immediately after withdrawal. The microscope should be carried to the bedside. In difficult cases the clinician has no right to take the specimen of spinal fluid, send it to the laboratory and expect the bacteriologist to make the diagnosis. Not only may diagnosis by this method be impossible, but valuable time is lost.

The spinal fluid in very early stages of epidemic meningitis may contain only six or eight hundred cells per cubic millimeter and some of them may be lymphocytes. On the other hand the fluid in poliomyelitis may contain at times from twelve hundred to two thousand cells some of which may be polymorphonuclear leucocytes. In the early stages of epidemic meningitis the meningococcus may be present in such small numbers that long search is necessary to reveal them.

In tuberculous meningitis also the spinal fluid may contain a number of lymphocytes well within the zone of possibilities for poliomyelitis. The tubercle bacillus may be exceedingly difficult to find. In one case where the thorough search of a number of slides from three specimens of spinal fluid failed to reveal the tubercle bacillus, animal inoculation was resorted to and by reducing the resistance of the guinea pig through the influence of Roentgen rays diagnosis was possible in five days.

The test for globulin may be of value in the differentiation of these infections of the central nervous system. A heavy globulin content is more frequent in the fluid withdrawn during the early stages of epidemic and tuberculous meningitis than in the corresponding stage of poliomyelitis.

There are two points in the epidemiology of poliomyelitis which have come out of our experiences in Westchester County:

First, we were able to trace an unusually large number of our cases to contact infection or obtain a history of contact with persons from infected districts;

Second, I am lead to believe that the quarantine period for contacts should be extended to sixteen days at least. We have observed children known to have been in contact with undoubted cases of poliomyelitis and quarantined for two weeks to come down with the disease two days after release. We have evidence which leads us to conclude that adults may transmit the disease to children after the former had come into contact with a case of poliomyelitis.

Third, it appears that a person may be in the communicative stage two days before the apparent onset of poliomyelitis.

Dr. Haven Emerson, *of New York City:* I wish to state that after accepting our cases and following them during the period we considered the infections to persist we found an error of 2 per cent., that is, of 9,000 and odd cases, we have received and observed as poliomyelitis, 2 per cent. were found during the course of the eight weeks' observation to have been either suffering from no illness or to have some other disease than poliomyelitis.

That is the margin of error in our experience as the result of the present combination of clinical observation plus laboratory examination of the spinal fluid.

Prof. C.-E. A. Winslow, *of New Haven, Conn.:* In closing, let me remind you that I approach this subject from the standpoint of the epidemiologist, not having any direct laboratory experience with this disease, but I think it is interesting to see how much epidemiology has to contribute, as shown in the discussion today. I think Mr. Hoffman is right in pointing out that the kind of work done along these lines, as, for instance, by Doctor Frost and Doctor Freeman has much that is material to offer, and in speaking of Mr. Hoffman, I cannot refrain from expressing my appreciation, which I think we all feel, of the service he has rendered by his great book on cancer, and by his statistics of dusty trades and in many other ways; services not demanded of him as a public official, but given freely and generously through public spirit.

Another thing has been very gratifying to me about this discussion—there has been no tendency to stress individual factors as all sufficient explanation; all through the discussion a spirit of open-mindedness has been manifest. The element of contact is of course one dominant feature; at every turn you are faced with the fact that this is a contagious disease. Two cases have come to my attention this summer along that line, one that of a wealthy man in Connecticut who placed guards all around his place, allowed nobody to leave it, bathed and disinfected himself, and changed his clothes in the garage every night when he came home, yet his child developed infantile paralysis. Somebody suspected the chauffeur, and it was found that he had secretly gone over to Brooklyn to visit his sister and while there had learned that his niece had just come down with the disease. Another case was that of a little outbreak that occurred on a lonely island 12 miles off the coast of Mt. Desert, where it was found that the first cases were in families that had gone out from an epidemic center in Portland. The second factor is susceptibility. I am absolutely in accord with all that Doctor Frost has said about the human reservoirs and the great importance of the unsuspected carrier, and I would like to remind you of the similarity between the condition here and in cerebrospinal meningitis. The third factor that we are quite certain affects the course of the disease is this other factor of season. This effect is not direct, it does not show day by day. We have plotted the cases in New York according to the temperature and humidity, and there is no rise as in infant mortality with an individual hot day; in fact, the one striking deviation in this curve is a drop in infant paralysis in the latter half of July, which was the most hot and humid period during the whole summer. On the whole, however, this is clearly a hot weather disease, a fact which distinguishes it from the ordinary nose and throat contact infections, all of them being winter diseases. Such a fact would fit in with insect transmission or with some form of food infection or with transmission which required an intestinal disturbance as a contributory factor. I have read Doctor Richardson's paper on rat and flea transmission and I think it is well worthy of careful study, but I am still less convinced than ever that there is an insect host here. I believe the line suggested today which is worthy of most serious attention at present as a working hypothesis is that there is an intestinal factor. That does not mean that the disease is spread by food epidemics; it means one of two things, either, as Doctor Park has suggested, that there is a contact food infection, the germ not living in the food for any length of time but being spread by contact first and then by food carrying the immediately soiled material into the intestinal tract, or that there is another factor entirely separate from the germ; the germ of infantile paralysis perhaps entering through the nose and throat and spreading by contact infection, but some other intestinal process being necessary to lower the vital resistance and let it get in.

A word in closing as to the practical method of control—I was greatly interested in what Doctor Ostheimer said about the Philadelphia regulations. That is a splendid example of the fact that over-severe regulations defeat their own end. It is better to have reasonable regulations and enforce them. I think we have good reason to congratulate ourselves on the general spirit that has been shown. Looking back a few years—I was in the 1909 epidemic, in a village where about 20 families lived on a little country road in the salt marshes. A light case developed, then a little further up the road a case that died, then another case in the same family, then another still nearer and the day after that was reported every one of us fled in panic. Bad as things have been this year, it has not been as bad as that; we are getting ahead and if we keep cool and continue to accumulate data in the spirit shown today, I look for success very soon.

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CROSS INFECTIONS IN FEVER HOSPITALS.

Dr. John Robertson, M.O.H., records an experiment of some importance in hospital administration made at the Lodge Road Hospital, Birmingham, during the year 1915. For a number of years suspicion attached to the cups, plates, knives, forks, and spoons used by the patients, of conveying infection from patient to patient, as they are all interchangeable. From June 1, 1914, to May 31, 1915, all crockery, etc., was sterilized after use by the patient. Observations were made on this incidence of other infections in 1,388 cases in the scarlet fever wards before the process of sterilization was inaugurated, and on 537 after it was commenced. Similarly, 334 cases of diphtheria were recorded before and 1,145 cases after disinfection, a total of 3,434 patients. The results tabulated below show that so far as scarlet fever and chicken-pox infection are concerned this sterilization was of distinct value.

I.—IN SCARLET FEVER WARDS.

	Before 1st June, 1912–31st May, 1913, 1,388 cases.		*After* 1st June, 1914–31st May, 1915, 537 cases.	
	Number.	%.	Number.	%.
No signs and remained free from scarlet fever	115	8.3	43	8.0
No signs and contracted scarlet fever	17	14.8	0	
Contracted chicken-pox	14	1.0	1	0.18
Contracted diphtheria	4	0.28	11	2.05
Contracted measles	3	0.20	4	0.75
Contracted any infection (total)	38	2.7	16	2.9

II.—IN DIPHTHERIA WARDS.

	Before 16th Oct., 1912–14th June, 1913, 344 cases.		*After* 1st July, 1914–30th June, 1915, 1,145 cases.	
	Number.	%.	Number.	%.
Contracted scarlet fever	11	3.2	17	1.5
Contracted measles	8	2.3	5	0.4
Contracted chicken-pox	1	0.3	10	0.8
Contracted any infection (total)	20	5.8	32	2.8

—*Medical Officer*, London, January 13, 1917.

THE LABORATORY DIAGNOSIS OF POLIOMYELITIS.

Josephine B. Neal, A. B., M. D.,
Chief, Meningitis Division, Bureau of Laboratories, Department of Health, New York City.

Read before the Laboratory Section, American Public Health Association, Cincinnati, Ohio, October 26, 1916.

THE Meningitis Division of the Department of Health was established six years ago in order to afford to the physicians of the city of New York expert assistance in the diagnosis and treatment of meningitis. Since 1910 we have held consultations in nearly 1,600 cases, presenting a great variety of meningeal conditions. These have included tuberculous meningitis, purulent meningitis of all kinds (meningococcic, pneumococcic, streptococcic, influenzal, staphylococcic); meningism in a variety of diseases, especially pneumonia, gastro-enteritis and other acute infections in children; many rarer conditions, such as brain abscess, brain tumor, syringomyelia, etc.; and over 500 cases of poliomyelitis, alone, 70 of which occurred before the incidence of the recent epidemic. During the epidemic, doubtful cases have been reported to us for diagnosis. As our work in the past had consisted in a careful clinical study of the cases, combined with various laboratory procedures, especially the examination of the spinal fluid, which we withdrew if the conditions seemed to warrant it, we had had experience that was particularly valuable to us in diagnosing these doubtful cases, for there is no purely "laboratory diagnosis" of poliomyelitis during the life of the patient though the laboratory aid in doubtful cases is indispensable. The development of experimental poliomyelitis in a monkey inoculated with an emulsion of the brain and cord of a patient who has died of the disease, makes the diagnosis. But if a monkey develops poliomyelitis after being inoculated with the washings of the nose and throat of a case, without the history and clinical findings, one cannot be sure that it is not a carrier rather than a true case. Moreover, on account of the varying susceptibility of monkeys and the small amount of virus present in the nose and throat washings, such a large number of negative results are obtained that the method would be unsuitable for routine diagnosis, even if it were not so expensive and did not take so long for results to develop.

These objections apply also to the neutralization test. This test consists in incubating a mixture of blood serum from a suspected case with a known active virus. This mixture is inoculated intracerebrally in one monkey and the virus alone in a control. The presence of antibodies in the serum is demonstrated if the control monkey becomes infected while the other monkey does not. A further objection to this method lies in the fact that the serum of many people known not to have had a recent attack of poliomyelitis shows the presence of antibodies. Other blood examinations are of little or no value. The count shows, as a rule, a leucocytosis and a polynucleosis, which is true of most infections with which poliomyelitis may be confounded. The complement fixation has so far been unsuccessful.

The examination of the urine has no diagnostic importance so far as is known at present. At first, it shows the characteristics of an acute febrile condition, later in the paralyzed cases, the end reaction of the products of muscle degeneration. Clinically, it should be noted that in the severe cases there is often a retention of urine, in the very severe cases occasionally a suppression.

The examination of the spinal fluid is the most valuable laboratory aid in the diagnosis of poliomyelitis, but even here, there are no pathognomonic findings, as for example, the infecting organism in a purulent or a tuberculous meningitis. It is by ruling out other conditions that it is of value and it is of the greatest service only when correlated with a careful clinical study of the case. (Of course no diagnosis is easier clinically than that of poliomyelitis with a frank flaccid paralysis, but few diagnoses are more difficult, clinically, than the non-paralytic and atypical cases, which are so important from the standpoint of epidemiology.)

During the recent epidemic, we have examined over 1,800 fluids from both the paralyzed and non-paralyzed cases, nearly 500 of these being from cases which we had seen in their homes.

The data from this material has not yet been entirely arranged as certain facts relating to our own cases have not been collected and there is yet considerable work to be done in studying the cytology of smears from the centrifuged fluids. Not wishing to give incomplete data nor to burden you with unnecessary details, I will give the more general facts and conclusions from the data that I have studied.

The spinal fluid in poliomyelitis is usually increased in amount and escapes under pressure. It is clear or slightly hazy in appearance and sometimes shows the febrin web formation which was formerly considered pathognomonic of tuberculous meningitis. Recently, attention has been called to the "ground glass" appearance (or a slight haziness seen in the fluid when viewed by strong transmitted light) as being of help in diagnosing poliomyelitis fluid. This appearance is found in the fluids containing the larger number of cells. When the cells are fewer, I, personally, should hesitate to say from the macroscopic appearance whether or not the cells are increased. Moreover, this appearance is also seen in the fluids of tuberculous meningitis, in early purulent meningitides with a slight cellular reaction and in normal fluids where there is a small amount of blood present. In view of these facts, the "ground glass" appearance is of little more significance than the increased quantity. If a bed side examination of the fluid is necessary, one should go with the proper equipment to make a fairly reliable examination.

In poliomyelitis, the spinal fluid shows evidence of an inflammatory reaction—there is a varying increase in the cells and in the albumin and globulin. In a few cases these evidences of an inflammatory reaction are well marked; in most cases they are moderate; while in a few cases, at the other extreme, they are so slight and the fluid so nearly approaches normal that it is difficult to make a definite statement in regard to the findings. The reduction of Fehling's in these fluids is practically always as prompt as in normal fluids.

The technic which we employ in examining spinal fluids is as follows:

All clear or slightly cloudy fluids are centrifuged for an hour at high speed. From the sediment, spreads are made, taking care to use as nearly as possible, the same area on the different slides. The sediments of clear fluids are stained by the Ziehl-Nielsen method for the tubercle bacillus—the sediments of slightly cloudy fluids for both the tubercle bacillus and by the Gram method. Smears from the poliomyelitis fluids were also made for special blood stains in order to study the cells. This work has not been completed. From this stained sediment, we can estimate the increase in cells as slight, moderate, great, or very great. We do not feel that the exact number of cells has more than an academic interest. The cell count in poliomyelitis and tuberculous meningitis, while on the average higher in the latter, overlaps for so wide a range as to render the differential diagnosis by this point most unreliable. Moreover, while some claims to the contrary have been made, it is not our impression that the number of cells in poliomyelitis fluids bear any relation to the prognosis of the case. We have made a fair number of cell counts in connection with the work and we find that, on the whole, the two methods check up fairly well. From these stained sediments we also estimate the percentage of mononuclears and polymorphonuclears and note the presence of endotheliod and polyform cells. The presence or absence of bacteria is also noted. Cultures are made from all specimens. In the case of uncontaminated poliomyelitis fluids, they have been uniformly negative.

The chemical tests that we use are the nitric acid ring test for albumin and the Noguchi butyric acid test for globulin. The albumin and globulin practically always run parallel, but they serve as a check on each other. The small amount of albumin and globulin present in normal fluids is marked ±. The signs, +, +1, ++, + + +, + + + +, represent increasing amounts and serve as a rough quantitative estimation. The presence of glucose is tested by using an equal amount of Fehling's solution and spinal fluid and it is marked with regard to the speed and the amount of reduction as −, ±, +, ++, + + +. The globulin reaction and the reduction of Fehling's should not be read for at least half an hour.

Taking up these points somewhat in detail, let us first consider the cytology. The increase in cells varies very greatly both in different cases and in the stage at which the puncture is done. Our counts have varied from slightly above normal, 15–20 to 350–400. The counts tend to fall off after the first week and by the end of the second week have fallen to practically normal in nearly all cases.

The cells usually show a preponderance of mononuclears but in a few instances there is over 50 per cent. of polymorphonuclears. It has been stated that early in the disease there was an excess of polymorphonuclears, which later was replaced by mononuclears. In the large number of early fluids that we have examined on the second, third, and fourth days, the polymorphonuclears—out of a special series of about 400 fluids in only 3 cases, occurring on the third, fourth, and fifth days respectively. We feel, therefore, that the polymorphonuclears represent a special type of reaction—and is not characteristic of a stage of the disease. Often, even in fresh fluids, the cells are so degenerated that it is difficult to classify them. There are large mononuclear cells that seem to be endotheliod in type that seem to us to occur more frequently in poliomyelitis than in other conditions. The so-called polyform cells are also found. We hope to study the various types of cells more carefully a little later.

The albumin and globulin are usually slightly to moderately increased. In 141 fluids, 99 were marked + or + 1; 36, + + or + + 1; 5, + + +; and 1, + + + +. The increase in albumin and globulin persists after the cell count has returned to normal.

Fehling's, as has been stated before, is practically always well reduced. The fluids that show a poorer reduction are usually those with the larger amount of albumin and globulin.

We will now consider the differential diagnosis of poliomyelitis fluids.

The slightly cloudy fluids must be differentiated from those of early cases of purulent meningitis and from the slightly cloudy fluid that occasionally occurs in tuberculous meningitis. The clear or practically clear fluids, from rare early cases of a purulent meningitis, tuberculous meningitis, syphilis of the central nervous system, especially acute syphilitic meningitis, and meningism. Other rarer conditions might be mentioned, but these are the most important.

In early cases of purulent meningitis, the spinal fluid shows a varying degree of cloudiness, except in very rare instances, when it may be clear. A greater increase in albumin and globulin is usually found here than occurs in poliomyelitis, with a poorer reduction of Fehling's solution. The cells in these fluids of purulent meningitis are 90 per cent. or more polymorphonuclears, and the etiological organism is always found except in the mildest cases. In certain mild cases of meningitis—probably of the epidemic variety—the meningococci may never be positively demonstrated in the fluid. In purulent meningitis, due to other organisms, these practically always appear later. In one instance only, we have seen a clear fluid from an early case of epidemic meningitis of about eighteen hours' standing. Although the cellular reaction was so slight, the meningococcus was demonstrated to be present in the fluid by smear and culture.

The fluid in tuberculous meningitis most nearly resembles that of poliomyelitis. It is practically always clear with a cellular increase consisting largely of mononuclears, though in very acute cases it may be distinctly cloudy with an excess of polymorphonuclears. Fortunately, in these cases, the tubercle bacillus is usually easy to demonstrate. The number of cells per cubic millimeter is usually greater than in poliomyelitis; the increase in albumin and globulin is more marked, and the reduction of Fehling's is not so good.

In rare instances when clinical signs are confusing and when the results of the cellular examination and chemical analysis are indefinite, and it is impossible to demonstrate the tubercle bacillus in the fluid, a positive diagnosis must wait upon the results of animal inoculation.

The fluid of an acute syphilitic meningitis closely resembles the fluid of a poliomyelitis, and the clinical signs are also confusing. The Wassermann reaction is the best method of differentiating the two conditions. Of course, a positive Wassermann would not rule out a poliomyelitis in an old syphilitic condition, but this, combined with the clinical condition and the progress of the case, makes one reasonably sure of the diagnosis. It was suggested at first that the products of degeneration present in the spinal fluid of poliomyelitis cases might give a non-specific Wassermann reaction. Repeated tests have proved this not true.

The fluid of meningism is clear, increased in amount and practically always normal in character. The few exceptions to this that we have found in a·large series of cases have fallen mainly into three groups: fluids from cases with prolonged and severe convulsions; fluids in severe whooping-cough; and fluids removed just prior to death. In these cases there have sometimes occurred an increase in cells, or in albumin and globulin or in both. In convulsions, there is probably oedema, in whooping-cough minute hemorrhages, and just before death circulatory changes to account for it.

Lange's colloidal gold test has been used to some extent by workers to whom we have given specimens of fluid and it would seem that it may be helpful in differentiating the fluids of poliomyelitis from those of tuberculous meningitis and from the fluids of meningism which are not normal in character.

Two rare types of spinal fluids sometimes occur in poliomyelitis when the hemorrhagic process has been more than usually severe. The first of these is of the true hemorrhagic character, the red blood cells being evenly diffused throughout the field. When collected in successive tubes the specimens are all homogenous, showing no change in the intensity of the hemorrhage. This serves to differentiate it from bloody fluids obtained by the accidental puncture of a vein.

Evidence of an older hemorrhage occurs in the second of these rarer fluids, which, having a characteristic yellow color and coagulating spontaneously, illustrates the so-called syndrome of Froin. These fluids occur in other conditions, and are, therefore, not pathognomonic of poliomyelitis.

During the past four months, we have done some quantitative work on the chemistry of the poliomyelitis fluids using the micro-chemical methods. This work will be published in detail later. In brief, I may state that it has been found that the *total nitrogen* runs 20–30 mgms. per 100 cc.

Of this total nitrogen about one-half is non-protein and about one-fourth is urea.

Creatinin—.5 mgm. in 100 cc. fluid.

Creatin—.3 mgm. in 100 cc. fluid.

Sugar is slightly lower than in the blood—.05 per cent.–.08 per cent.

All show traces of cholesterol.

In conclusion, I wish to state again that there is no specific laboratory diagnosis of poliomyelitis during life though the laboratory findings are of the greatest possible aid; that physicians can most successfully diagnose the doubtful cases who have had the most experience with the clinical study of meningeal conditions of all kinds, correlated with the laboratory study of the spinal fluids.

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THE HEALTH BULLETIN.

The health officer has ever had a variety of duties. What with controlling foci of infection, inspecting suspected food, and offensive privies, protecting water supplies, draining swamps, and determining the fate of sundry noisy and sleep disturbing fowls of a neighborhood, he has had enough to keep him thinking and acting. Recently, however, he has had thrust upon him the business of editor, and often author, of a weekly or monthly publication in the interests of public and private health. Though presumably unprepared for such a service the health officer has risen to the occasion remarkably well.

The issuance of a bulletin was not a new thing for the health department, for a statement of the number of cases of this and that disease and the number of deaths, the number of diagnostic tests made, and a summary of other work, had often been published. But the new bulletin deals with matters of life and health rather than disease and death—in a word, with prophylaxis. The statistics, which we fear were seldom scanned, occupy the background in this new literary venture.

In its present (though we doubt its final) stage of evolution, the health bulletin is often an amphibious affair, intended for both the profession and the public, and for this and other reasons, appealing less than it might, to either. The material intended for physicians is often of a nature perplexing to the laity. In fact we have seen such material so poorly worded or badly edited that the medical reader himself was sorely puzzled as to its meaning. In other cases members of the health staff, excellent in their special lines of bacteriological or other work, have put things in a way which has thrown doubt upon their efficacy. Careful editing would have prevented such a misfortune.

On the "popular" side the health bulletin has too often accepted the usual notion that in order to appeal to the public, one must highly color, or in other words, a little, if not considerably, exaggerate the facts. If this is the key to the lay mind, the earlier the key is lost the better. But the layman is not so stupid. You can fool him some of the time but not always, and exaggerations always react upon their source.

When it comes to sensational methods in health education the health bulletin cannot hold a candle to the advertisers of curealls, for they not only have the literary cleverness, but they have the financial backing. Their reading matter is not sent "to those who desire it" but is spread broadcast and reaches a hundred homes where the health bulletin reaches one. The competition is most one sided, but truth and dignity will prevail even over lies. The kingdom of health, like that kingdom of heaven of which it is an essential part, is like a grain of mustard seed and will surely grow and increase. Let us avoid doing anything that will delay that growth. The health bulletin is an aid toward furthering the kingdom, but let it be worthy of its cause.—Editorial, *New York Medical Journal*, January 27, 1917.

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THE REGISTRATION AREA FOR BIRTHS.

The recent establishment by the Director of the Census of a registration area for births is one of the big steps of progress which mark our civilization.

This area for 1916 included the six New England States, New York, Pennsylvania, Michigan, Minnesota, Maryland, and the District of Columbia, or 32.4 per cent. of the population of the United States.

Other states will be admitted as soon as they register 90 per cent. of their births. In view of the great interest everywhere in the welfare of children the growth of this area should be rapid. Indeed, in a few years it should include the entire United States. Then the children of our land will be able to prove their ages whether the knowledge be necessary to enter school, to go to work, or to prove rights to inheritance. Then it will be possible annually to measure and compare the birth-rates in all parts of the United States. Then it will be possible annually to measure and compare the infant mortality-rates in all parts of the United States. Then, if the infant mortality-rates are found to be higher in one region than in another, if they are found to be higher among certain classes of our population, or among certain race stocks, the reasons therefor will be promptly sought and discovered, and more definite plans made to save the babies.

This is looking a bit into the future, but only to the logical conclusion of the recent establishment of the registration area for births. Now is the time to push this work so auspiciously begun. Now is the time for every parent to insist that the rights of his child be safeguarded by a proper birth entry in the official records. Now is the time for every state to test the completeness of its birth registration. Now is the time for every state to find out why 90 per cent. of its births are not recorded. Now is the time for the state legislatures to enact better registration laws where needed. May all, therefore, quickly realize that the Nation needs every state in this registration area.

THE HEALTH INFORMATION BUREAU.

During the latter part of 1916 the Association established its Health Information Bureau. This service is available to all subscribers of the JOURNAL, and is free. By the establishment of such a service, it was felt that there could be placed more directly at the disposal of the subscribers the many advantages the Association enjoys because of its unique position in the field of public health. The creation of this service is in accordance with the newer policy of the Association to extend its usefulness.

Among the twoscore questions received so far, we are reproducing several which we trust will not only describe the scope of this service, but, too, will serve, shall we say, as a stimulant and produce a greater activity between this Bureau and the subscribers.

A superintendent of health asks for a method to obtain pure drinking water for a small consolidated school, newly built, in a locality where the water is unfit for use.

A national organization asks where information can be obtained relative to the per capita health expenditure of Massachusetts towns.

A health officer of a southern city requests the names of all cities issuing weekly or monthly bulletins on health.

The same health officer asks for a list of books dealing with sanitary inspection of establishments where foodstuffs are manufactured, sold or handled.

An epidemiologist is desirous of knowing what dry heat temperatures are necessary to kill body lice and their nits.

An industrial hygiene expert requests information relative to the most recent literature on ozone and ozonators.

A health officer desires information relative to a special inside toilet. In this connection we have received numerous inquiries relative to privies and toilets.

A number of requests have been received for information concerning health exhibits and health motion picture films.

To be sure a wide field is covered, but in creating this service it was realized that the field was broad and our resources capable of meeting all ordinary demands. If this Bureau can be of the slightest aid to you, we trust that you will feel disposed to make full use of it.

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BIRTH CONTROL IN ITS MEDICAL, SOCIAL, ECONOMIC, AND MORAL ASPECTS*

S. Adolphus Knopf, M. D.,

Professor of Medicine, Department of Phthisiotherapy, at the New York Post-Graduate Medical School and Hospital; Visiting Physician to the Riverside Hospital-Sanatorium for the Consumptive Poor of the Health Department of the City of New York.

WHEN at this very moment across the sea in Europe the best blood of the nations which were heretofore considered the most enlightened, cultured, and civilized, is daily being shed and hundreds of thousands of young men in the prime of life sacrificed to the Moloch of war, it must seem a hazardous undertaking to talk of birth control, which means artificial birth limitation and by some superficial observers is designated as race suicide. I trust, however, that before I arrive at the end of my paper, I will have convinced you that the object of my appeal is not a plea for reducing the population but for increasing its vigor by reducing the number of the physically, mentally, and morally unfit and adding to the number of physically strong, mentally sound, and higher morally developed men and women.

In accordance with the program outlined, I will deal first with the medical and sanitary aspects of the subject. No one will deny that we occasionally come across a family, well-to-do and intelligent, where the parents by reason of unusual vigor, and particularly by reason of the physical strength of the mother, have been able to rear a large number of children. In some instances all have survived and have grown up to be healthy and vigorous. But these instances are rare and are becoming more and more so every day. On the other hand, large families, that is to say, numerous children as the issue of one couple, among the ignorant, the poor, the underfed and badly housed, the tuberculous, the degenerate, the alcoholic, the vicious, and even the mentally defective, is an everyday spectacle. It is well known to every general practitioner whose field of activity lies among the poor and the above mentioned classes, that the infant mortality among these is very great. The same holds true of the mortality of school children coming from large families among these classes of the population.

Concerning tuberculosis, with which, by reason of many years' experience, I am perhaps more familiar than with other medical and social diseases, let me relate the interesting fact that a carefully taken history of many, many cases has revealed to me that with surprising regularity the tuberculous individual, when he or she comes from a large family, is one of the later born children—the fifth, sixth, seventh, eighth, ninth, etc. The explanation for this phenomenon is obvious. When parents are older, and particularly when the mother is worn out by frequent pregnancies and often weakened because obliged to work in mill, factory, or workshop up to the very day of confinement, the child will come into the world with lessened vitality, its main inheritance being a physiological poverty. This systemic poverty will leave it less resistant, not only to tuberculosis but to all other diseases of infancy and childhood as well.

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* This address was first delivered at the 44th Annual Meeting of the American Public Health Association in Cincinnati, O., October 27, 1916. It was again delivered upon invitation on subsequent dates before the East New York Medical Society, the New York Woman's City Club, and the Social Service League of the Unitarian Church of the Messiah.

The morbidity and mortality among these children is greatest when the children are most numerous in one family. Miss Emma Duke, in the third of the Infant Mortality Series, gives the result of a field study in Johnstown, Pa., based on the births of one calendar year (1911). The inspection was made in 1913, of the 1911 babies, so that even the last born baby included had reached its first birthday—or rather has had a chance to reach its first birthday; many of them were dead long before that day. The following is Miss Duke's table showing the infant mortality rate for all children born by married mothers in Johnstown during that year:

Deaths per 1,000 births in	
Families of 1 and 2 children	108.5
Families of 3 and 4 children	126.0
Families of 5 and 6 children	152.8
Families of 7 and 8 children	176.4
Families of 9 and more children	191.9

Dr. Alice Hamilton of the Memorial Institute for Infectious Diseases, Hull House, Chicago, made a study of 1,600 families in the neighborhood of the settlement. The following is the table of the child mortality rate of the 1,600 families as published by Doctor Hamilton:*

Deaths per 1,000 births in	
Families of 4 children and less	118
Families of 6 children	267
Families of 7 children	280
Families of 8 children	291
Families of 9 children and more	303

Many families were found of thirteen, fourteen, and even sixteen members. The largest of all was that of an Italian woman who had born twenty-two and raised two. The small families of every nationality had a lower mortality rate than the large families of the same nationality. The Jewish families of four and less had the astonishingly low mortality rate of 81 per 1,000, while in families of eight and less, the rate rose to 260 per 1,000.

The larger the family, the more congested will be the quarters they live in and the more unsanitary will be the environment. Last, but not least, with the increase of the family there is by no means a corresponding increase of the earning capacity of the father or mother, and as a result malnutrition and insufficient clothing enter as factors to predispose to tuberculosis or cause an already existing latent tuberculosis to become active.

What is the result of this condition in relation to tuberculosis—one single disease? Out of the 200,000 individuals who die annually of tuberculosis in the United States, 50,000 are children. Of the economic loss resulting from these early deaths I will speak later on, but in continuing along the medical and sanitary lines of my subject, I must call your attention to the fact that according to some authors 65 per cent. of women afflicted with tuberculosis, even when afflicted only in the relatively early and curable stages, die as a result of pregnancy which could have been avoided and their lives been saved had they but known the means of prevention.* Some times we succeed in saving such a mother by a timely and careful emptying of the uterus. But an abortion even scientifically carried out and only resorted to with the view of saving the life of the mother, is never desirable, either for the consultant to advise, nor for the gynecologist or obstetrician to perform; and who will dare to say that even under the best conditions this operation is devoid of danger.

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* Bulletin of the Amer. Acad. of Med., May, 1910, and Miss Mary Alden Hopkins in *Harper's Weekly*.

What is the explanation and what are the consequences from the point of view of sanitation, of the death of 50,000 tuberculous children? They have mostly become infected from tuberculous parents or tuberculous boarders who had to be taken into the family to help pay the rent. In the crowded homes of the poor there was neither sunlight, air, nor food enough to cure the sufferers and before they died they became disseminators of the disease. Nearly all of the infectious and communicable diseases are more prevalent in the congested, overcrowded homes of the poor, and particularly of those with large families. The propagation of syphilis and gonorrhoea by contact infection, other than sexual, can sometimes be avoided in the homes of the well-to-do, by enlightenment and the conscientiousness of the afflicted. They are almost invariably communicated to the innocent in the homes of the ignorant and poor. Gonorrhoeal infection from parent to child or from one infected member of the family to the other, is responsible more than anything else for the 57,272 blind persons in the United States.*

The great syphilographer Fournier left us the following irrefutable statistical evidences of the seriousness of syphilitic transmission. As a result of paternal transmission there is a morbidity of 37.0 per cent., and a mortality of 28.0 per cent.; maternal transmission results in 84.0 per cent. morbidity and 60.0 per cent. mortality; and the combined transmissions are no less than 90.0 per cent. of morbidity and 68.5 per cent. mortality.†

I venture to say right here that would or could a syphilitic or gonorrhoeic parent be taught how to prevent conception during the acute and infectious stages of his or her disease, there would certainly be less inherited syphilis, less blindness from gonorrhoeal infection; in other words, less unfortunate children in this world handicapped for life and a burden to the community.

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* C. A. Credi-Hoerder: "Tuberkulose und Mutterschaft." (J. Kraeger, Berlin, 1915.)

* United States Census, 1910.

† Berkowitz: "Late Congenital Syphilis." N. Y. *Medical Journal*, June 17, 1915.

That insanity, idiocy, epilepsy, and alcoholic predisposition are often transmitted from parent to child is now universally admitted, and corroborated by every day experience and by an abundance of statistics. Countless are the millions of dollars expended for the maintenance of these mentally unfit. The State of New York alone spends $2,000,000 annually for the care of its insane. Whether sterilization of these individuals would be the best remedy is a question still open for discussion. The constitutionality of the procedure is doubted by some of our legal authorities. Segregation is resorted to in the meantime with more or less rigor according to the State laws. Every year, however, many of the individuals who had been committed to institutions for the treatment of mental disorders are discharged as cured. They are allowed to procreate their kind. Would it not be an economic saving if at least the individuals whose intelligence has been restored were instructed in the prevention of bringing into the world children who are most likely to be mentally tainted and to become a burden to the community?

The economic loss to our commonwealth from bringing into this world thousands of children mentally and physically crippled for life is beyond calculation. But considering tuberculosis we have been able to calculate at least approximately what it costs. I stated above that 50,000 children die annually from tuberculosis in the United States. Figuring the average length of life of these children to be seven and one-half years and their cost to the community as only $200 per annum, represents a loss of $75,000,000. Such children have died without having been able to give any return to their parents or to the community. Who will dare to calculate in dollars and cents the loss which has accrued to the community because so many mothers died of tuberculosis when an avoidable pregnancy was added to a slight tuberculous ailment in a curable stage? Who will dare to estimate the cost of the loss of an equally large or perhaps larger number of mothers afflicted with serious cardiac or renal diseases, or frail or ill from other causes, whose lives could have been prolonged had an additional pregnancy not aggravated their condition?

Of the many mothers, married and unmarried, who have become chronic invalids and even lost their lives as a result of having resorted to abortive measures in order to rid themselves of an unwelcome child, no statistics are available. If there were, they would be an appalling evidence of the great danger of such criminal procedures and would certainly show the advantage of a more enlightened attitude regarding the means of contraception, at least for the married women who are enfeebled or diseased.

The many diseases I have mentioned whereby children in large families and mothers because of too frequent pregnancies are carried off to an early grave, are not limited to the poor. In regard to economics, the middle class suffers also. Thus, if even a relatively well-to-do family begins to increase out of all proportion to the earnings of the father, the family will soon be in want and approaching poverty. Less and less good food, less sanitary housing, less care of the children, and more sickness will almost inevitably result. Every sickness or death of child or adult has increased the expenses of the family. There is the doctor's bill, the druggist's bill, and last but not least, that of the undertaker. A grave had to be purchased. If there have been savings, they are gradually swallowed up and debts are often contracted for the sake of a decent funeral.

Next to the medical and sanitary comes the physiological aspect of birth control, which can be summarized in a very few sentences. The average mother with two, three, or four children, not having arrived in too rapid succession, say with two or three years intervening, is physiologically, that is to say physically and mentally, stronger and better equipped to cope with life's problems than the worn out and weakened mother whose life is shortened by frequent and numerous pregnancies.

What is the physiological effect of voluntary artificial restriction of the birth-rate? In Holland, where the medical and legal professions have openly approved and helped to extend artificial restriction of the birth-rate, the health of the people at large, as shown by its general death-rate, has improved faster than in any other country in the world. At the recent Eugenics Congress it was stated that the stature of the Dutch people was increasing more rapidly than that of any other country—the increase being no less than four inches within the last fifty years. According to the Official Statistical Year Book of the Netherlands, the proportion of young men drawn for the army over 5 ft. 7 in. in height has increased from 24½ to 47½ per cent. since 1865, while the proportion below 5 ft. 2½ in. in height has fallen from 25 per cent. to under 8 per cent.*

In that enlightened country, the teaching by the medical profession of the most hygienic methods of birth limitation has enabled the poor to have small families which they could raise to be physically and morally better equipped than formerly. What is most interesting to observe, however, is that, whether as a result of this or for some other reason, the families among the well-to-do are not nearly as small as in other countries.

In Australia and New Zealand, the means of artificial restriction are in free circulation and the restriction of families is almost universal. Yet these two English colonies have furnished to their mother country in these hours of struggle the most efficient, and physically and mentally best equipped regiments. The soldiers of Australia and New Zealand have shown themselves brave and fearless fighters and certainly equal, if not superior, as far as physical endurance is concerned, to their English brethren. In the latter country, it is well known birth control is frowned upon by the legal and nearly all the ecclesiastical authorities.

And what of France? Before the present war Drysdale, in his "Small Family System," very aptly says: "It has become the fashion to speak of the depravity of France, of her alcoholism, of her disregard for law and order, and of her terrible 'crimes passionels,' and to ascribe to them the falling birth rate. If this were the case it is obvious that these evils would be most intense where the process had gone furthest, *i. e.*, in the cantons of the lowest birth rate (The French islands of Ré and Oleron)." The passions of the inhabitants of these islands are very innocent. "They are reading and dancing. The dancing, always decent, is the preparation for marriage; illegitimate births are very rare. One could not imagine manners more pleasant or more honorable. Nevertheless the birth rate in these islands is among the lowest. It it because everyone there is more or less of a proprietor. Each person has some property to protect; each is ambitious for his children." But we have the authority of Doctor Bertillon, the great French statistician, that it is just in the cantons of these islands in which the greatest moral improvement has taken place, and that where the French have obeyed the command to increase and multiply, there alcoholism and crime abound.

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* "The Small Family System; Is It Injurious or Immoral?" By Dr. C. V. Drysdale; Publ. by B. W. Huebsch, New York.

Let me quote briefly from an editorial on contraception which appeared in the *Medical Times* of April, 1916: "France today is presenting her splendid spectacle of utter efficiency to the world because only the fittest of her people have survived, and the chief factor there has admittedly been contraception. Surely we have heard the last of the croakers about decadent France. Holland would give an equally good account of herself if the need should arise and for the same reason."

We have already touched in part on the economic cost growing into the millions which accrues annually to the nation because of a high birth-rate concomitant with a high infant and child mortality rate. Well may we ask the question whether disease and the deaths of thousands of women and children can not be prevented by an enlightened attitude toward the question of birth control. Why is it not done? If the millions of dollars expended uselessly reverted to the nation's wealth, would they not add immeasurably to the health and economic happiness of the nation at large?

And now we come to the social or sociological aspect of our topic, so closely interwoven with economics. That the social and moral life of a smaller family, where the father earns enough to support wife and children and where the mother can devote her time to the care of them, and where neither she nor the children must go out and help in the support of the family, is superior to that of a family with a large number of children where the mother and often the older children must slave, does not permit discussion. The larger the family of the poor the more child labor, the more there is disruption and irregularity, and the more frequently one finds a lower standard of life and morals in general.

The records of our charities and benevolent societies amply prove that as a rule the larger the families are that apply for relief the greater is their distress.

In answer to a letter from Doctor Foote, containing suggestions on this topic, the president of the New York Association for Improving the Condition of the Poor very pertinently said:

"The race suicide theory which has been so much exploited of late, is an immense encouragement to the large family idea and the illiterate are hardly to be blamed if they are misled upon this question. The subject that you discuss is one that is worthy of serious consideration and that has in the past been treated with an excess of sentiment."

That judicious birth control does not mean race suicide, but on the contrary race preservation, may best be shown from the reports from Holland. The average birth-rate in the three principal cities of Holland was 37.7 per 1,000 in 1881, when birth control clinics were started. In 1912 it had fallen to 25.3 per 1,000. The general death-rate, however, had dropped in the same period from 24.2 to 11.1 per 1,000, or to less than half, while the two-thirds reduction in the mortality of children under one year of age—from 209 to 70 per 1,000 living births—is even more significant. (*Birth Control News*, published by Birth Control League of Ohio, Cleveland, Vol. I, No. 1.)

As a final evidence of the social and economic value of imparting information concerning family limitation, permit me to quote from a personal letter to me from the great pioneer of this humanitarian movement, Dr. J. Rutgers, the Honorable Secretary of the Neo-Malthusian League of The Hague. The league has been in existence since 1888 and received its legal sanction by a royal decree January 30, 1895. It has 6,000 contributing members; all information is given gratuitously. As a result of this league in Holland one does not see any more children dressed in rags as in former years prior to the starting of this movement. To use the venerable secretary's own words: "All children you now see are suitably dressed, they look now as neat as formerly only the children of the village clergyman did. In the families of the laborers there is now a better personal and general hygiene, a finer moral and intellectual development. All this has become possible by limitation in the number of children in these families. It may be that now and then this preventive teaching has caused illicit intercourse, but on the whole morality is now on a much higher level and mercenary prostitution with its demoralizing consequences and propagation of contagious diseases is on the decline. The best test (the only possible mathematical test) of our moral, physiological, and financial progress, is the constant increase in longevity of our population. In 1890 to 1899 it was 46.20; in 1900 to 1909 it was 51 years. Such rise cannot be equalled in any other country except in Scandinavia where birth limitation was preached long before it was in Holland. None of the dreadful consequences anticipated by the advocates of clericalism, militarism, and conservatism have occurred. In spite of our low birthrate the population in our country is rising faster than ever before, simply because it is concomitant with a greater economic improvement and better child hygiene."

To verify these figures statistically, Doctor Rutgers refers to Drysdale's diagrams.* The good doctor closes his splendid letter by saying: "One must have been a family physician for twenty-five years like myself in a large city (Rotterdam) to appreciate the blessings of conscious motherhood resulting in the better care of children, the higher moral standard. And all these blessings are taken away from you by your government's peculiar laws, made to please the Puritans."

To these latter well-meaning people and those similarly minded who fear race suicide, particularly a decline of the American stock, I strongly recommend the reading of that splendid address by Professor Charles A. S. Reed, A. M., M. D., former president of the American Medical Association, entitled "The American Family." In the chapter on "The Outlook of the American Family" he very pertinently says: "We see in a declining birth-rate only a natural and evolutional adjustment of race to environment—an adjustment that insures rather than menaces the perpetuation of our kind under favoring conditions." And concerning under-population in general, this distinguished writer says in the same address: "It seems, indeed, to the careful student that the danger to the American family today and still more in the future lies in the direction of overpopulation rather than under-population."

According to Mulhall and Reed, the increase in the density of population from 1820 to 1890 was 650 per cent. in the United States (only 25 per cent. in the United Kingdom and less than 100 per cent. in France and Belgium). The rate of increase in this country has been vastly accelerated in the twenty-five years that have since elapsed. Our population today of over 100,000,000 has been doubling itself on an average of once in less than twenty-five years since 1790, and it will probably continue to do so in the future. May I say in passing, that in the State of New York we have observed the alarming phenomenon that the proportional increase among the insane is double that among the sane population?

And now I approach the last and most important phase of my subject, namely the moral, which to me means no less than the religious phase of this great problem. Let me say to you, my colleagues, that I approach it with awe and reverence, for I believe I fully understand the import of it.

A quarter of a century of practice among the tuberculous, the rich and the poor, in palatial homes, humble cottages, dark and dreary tenements, and in overcrowded hospitals, has shown me enough to bring to my mind the utter immorality of thoughtless procreation, and my experience has been limited to this one disease of the masses. The tears and sufferings I have witnessed when I have had to decline help because it was too late to prevent the despair of the poor, frail mother at the prospect of another inevitable confinement, and later the sight of a puny babe destined to disease, poverty, and misery, has made me take the stand I am taking today. I am doing it after profound reflection, and I am fully aware of the opposition I am bound to meet. But in my early career as an antituberculosis crusader, I became accustomed to the fate of those who venture on new and heretofore untrodden paths of progress.

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* "Diagrams of International Vital Statistics With Description in English and Esperanto, together with a Table of Correlation Coefficients Between Birth and Death-rates, etc." By C. V. Drysdale, D. Sc.; London: Wm. Bell, 162 Drury Lane, W.C., 1912.

What would the moral outcome of birth control, or let us rather say, rational family limitation be, if taught judiciously to those seeking and needing the advice? Millions of unborn children would be saved by contraception from the curse of handicapped existence as members of a family struggling with poverty or disease.

There are hundreds of young men and women, physically and morally strong, who gladly would enter wedlock if they knew that they could restrict their family to such an extent as to raise few children well. But their fear of a large family retards, if it does not prevent, their happiness and *ipso facto* the procreation of a better and stronger manhood and womanhood. The woman withers away in sorrowful maidenhood and the man whose sexual instincts are often so strong that he cannot refrain, seeks relief in association with the unfortunate and often diseased sisters, called prostitutes. The result is a propagation of venereal diseases with all its dire consequences. To an audience composed of physicians and sanitarians I need not say what these consequences are. They involve sterility, physical and mental suffering in the man, or sterility in both man and woman; and according to the severity of the infection, abortion, premature labor, a dead child, or one lastingly tainted with disease

At times disease does not enter as a factor in the tragedy, but the result is a girl mother, a blasted life, for our double standard of morality recognizes only the "sin" in our sisters, not in ourselves. Of her, compassionate tongues only say she loved not wisely but too well; of him, nothing is said at all. He is spotless and virtuous in the eyes of the world and can go through life as if he had never sinned and been responsible for a blasted life or two.

Even our moralists must acknowledge that by an early marriage with a man of her choice, enabled by understanding to limit the number of children, many a girl would be saved from so called dishonor and in many instances from prostitution. One of the strongest arguments of our moralists and purists is that the knowledge of contraception would lead the young to enter forbidden sexual relations and degrade them morally. Granted that this may happen in a number of instances, the benefit derived from a diminution of venereal diseases, from a greater number of happy and successful marriages among the younger people, fewer but better and healthier offspring instead of an unrestricted procreation of the underfed, the tuberculous, the alcoholics, the degenerate, the feeble-minded and insane, would more than outweigh the isolated instances of sexual intercourse prior to marriage.

I absolutely agree with our moral teachers when they say that self-control is possible, but while it may be easy for many it is not easy for all. Sociologically speaking, it is even more difficult when you deal with a married couple belonging to the poorer classes who cannot have separate bedrooms. Self-control can be more easily exercised prior to marriage than afterwards.

The critics of birth control maintain that with the knowledge of birth limitation many women, whether poor or rich, who should and can bear children will shirk the duties of motherhood. This I do not believe to be true. You can no more prevent the desire for motherhood in the normal, healthy woman than you can stem the tide of the ocean. It is inherent in every woman's heart. With more marriages of young people and a rational birth control, I do believe there will not be fewer children but the same number of better ones. There will be, of course, instances—and there are too many in certain classes of society now—where for purely selfish reasons the marriage remains barren, but it is a question in my mind whether it would be really desirable for society to have such women be mothers.

It has been asserted by the same critics that the enfeebled, diseased, ignorant, and poverty stricken woman in whose case birth control might be justified, will never know about the existence of birth control clinics. In Holland, however, there must have been some such ignorant women, yet they seem to have learned to avail themselves of the service of such clinics. Besides, these classes will sooner or later come under the observation of some physician, either privately or in a hospital. Some opponents to the birth control propaganda say that the measure advocated would not reach the feeble-minded, the idiotic, half insane, chronic alcoholics, and chronic criminals. This I will grant, and sterilization of those totally unfit for parenthood will some day have to become a state measure, unless segregation is resorted to more universally and more rigorously. Birth control is only one measure toward a saner and happier manhood, womanhood, and childhood.

Finally, I must mention the almost pathetic criticisms of some of my colleagues who wrote me, in answer to my request for an expression of opinion, that the matter of birth control was a question not for the medical profession, but for the laity. To such I can only express my regret at their attitude. The physician of the twentieth century who deals only with the purely medical and curative part of his profession, who is indifferent to measures to prevent disease, and cannot feel with the social sufferings of the masses, is lacking in the highest ideals of his calling and misses the greatest opportunity of benefiting suffering mankind.

After all is said, I feel impelled to plead with great earnestness for the abolishment of the state and federal laws which make the imparting of knowledge for contraception a criminal offense. I plead for the establishment of gratuitous clinics, directed by regular physicians of high repute, remunerated by city or state, who are competent to give information as to birth limitation in cases where they deem the giving of such instructions advisable.

Concerning the urgency and the wisdom of efforts to change these laws* I am sure that you will be willing to listen to the words of two of our greatest American physicians; first, to those of our venerable nestor of the medical profession, Professor A. Jacobi of New York, the ex-president of the American Medical Association; secondly, to Professor Hermann M. Biggs of New York, my beloved teacher, the distinguished sanitarian and pioneer in the modern warfare against tuberculosis. In his preface to Dr. William J. Robinson's book "The Limitation of Offspring," Dr. Jacobi says: "Our federal and state laws on the subject of prevention of conception are grievously wrong and unjust. It is important that these laws be repealed at the earliest possible moment; it is important that useful teaching be not crippled, that personal freedom be not interfered with, that the independence of married couples be protected, that families be safe-guarded in regard to health and comfort, and that the future children of the nation be prepared for competent and comfortable citizenship."

Dr. Hermann M. Biggs, prior to the recent dismissal of the case by Judge Dayton of the Federal Court, against Mrs. Sanger for sending information about birth control through the mails, gave to the press the following statement: "I am strongly of the opinion that the present laws in regard to the giving out of information in relation to the governing of infant control are unwise and should be revised. There can be no question in the mind of any one familiar with the facts that the unrestricted propagation of the mentally and physically unfit as legally encouraged at the present time is coming to be a serious menace to civilization and constitutes a great drain on our economic resources. This is my personal view."

To the foregoing expressions of opinions let me add what one of our most distinguished jurists, the Hon. Judge William H. Wadhams, of the Court of General Sessions, wrote me concerning these laws: "In order to save the state from the burden of large families, where there is no possibility of their being supported and where the neglect which follows often results in their becoming State charges not only because they are mentally but often physically unfit to bear the burden of life, I am of the opinion that there should be some proper birth regulation after a certain number of children have been born, and that, therefore, there should also be some modification of the laws with respect to the giving of information upon this subject. I think the sanitary, medical, social, economic, and moral status of the population would be improved by proper and more general information upon this subject."

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* United States Criminal Code, Section 211 (Act of March 4, 1909, Chapter 321, Section 211, U. S. Statutes at Large, Vol. 35, part 1, page 1088 *et seq.*). New York Statute Book, (Section 1142 of the Penal Law). The federal law prescribes a fine of $5,000 or imprisonment of not more than five years, or both, for any one using the mails to give advice for producing abortion or preventing conception. The New York State law, above mentioned, makes the giving of a recipe, drug or medicine for the prevention of conception or for causing unlawful abortion a misdemeanor punishable with no less than ten days nor more than one year imprisonment or a fine of not less than $50 nor more than $1,000, or both, fine and imprisonment for each offense. It will be noticed that both laws make the giving of advice for the prevention of conception as great an offense as producing abortion. According to the New York State law, a "lawful" abortion is permitted and not punishable, but to prevent such abortion, always more or less dangerous to life, is not permitted and punishable by law. In all medical colleges careful instruction is given how to perform the "lawful" abortion. All good textbooks on gynecology describe the operation as carefully as an amputation of the cervix or a hysterectomy; but concerning the advice to give, for example, to the poor tuberculous mother who has had her uterus emptied once, so that she may not be obliged to submit to such a "lawful" operation again, our teachers of gynecology and our textbooks dare not say a word.

Besides the letter from this eminent judicial authority and the strong expressions of opinion of A. Jacobi, M. D., and Hermann M. Biggs, M. D., I have been the recipient of communications from many leading physicians, divines, political economists, and sociologists, all agreeing with me that judicious birth control, under the highest ethical and medical guidance, is a national necessity and that our present laws on the subject need urgent revision. For want of space I will mention only the following: Dr. John N. Hurty, secretary, Indiana State Board of Health; Dr. Godfrey R. Pisek, professor of diseases of children, New York Post-Graduate Medical School and Hospital; Dr. J. W. Trask, of Washington, D. C.; Dr. Lydia Allen de Vilbiss, formerly of the New York State Department of Health, now in charge of the division of Child Hygiene of the State Board of Kansas; Dr. Ira S. Wile, editor of *American Medicine*, New York; Dr. John A. Wyeth, professor of surgery and president of the New York Polyclinic Medical School and Hospital, ex-president of the American Medical Association and New York Academy of Medicine; Frank Crane, D. D., formerly pastor of the Union Congregational Church of Worcester, Mass., now well known writer of leading editorial articles; Percy S. Grant, D. D., rector, Protestant Episcopal Church of the Ascension of New York City; Frank Oliver Hall, D..D., minister of the Church of the Divine Paternity, New York City; John Haynes Holmes, M. A., Minister, Unitarian Church of the Messiah, New York City; Stephen S. Wise, D. D., Rabbi of the Free Synagogue, New York City; James A. Field, Ph. D., Professor of economics, University of Chicago; Irving Fisher, Ph. D., professor of political economy of Yale University and chairman of the Hygiene Reference Board of the Life Extension Institute; Franklin H. Giddings, Ph. D., professor of political science, Columbia University; William H. Allen, Ph. D., director of the Institute for Public Service of New York City; Hon. Homer Folks, former commissioner of charities of New York, now secretary of the State Charities Aid Association of New York; Lillian D. Wald, founder of the Henry Street Settlement and originator of the work of the School Nurse in New York; Prof. Melvil Dewey, LL.D., educator and president of the National Society for Efficiency.

I leave it to this distinguished body of physicians and sanitarians either to send a memorandum to the federal and all state governments setting forth the reason for a change of these laws, or, if it is thought wiser, to form a committee to study the best and most practical suggestions for federal or state legislatures to act upon.

Dr. William L. Holt, writing on birth control as a social necessity and duty, says: "Conscious and limited procreation is dictated by love and intelligence; it improves the race. Unconscious, irresponsible procreation produces domestic misery, and half-starved children. Conscious procreation of human lives elevates man to the gods. Unconscious procreation degrades man to the level of brutes."

May I be permitted to close with what I am free to confess is my innermost conviction? I believe in birth control, that is to say, birth limitation, based on medical, sanitary, ethical, moral, and economic reasons. I believe in it because with the aid of it man and woman can decide when to have a child, work and prepare for its arrival, welcome it as the fulfilment of their heart's desire, watch over it, tenderly care for and educate it, and raise it to be what every child should be destined to be—a being happy, healthy, strong in mind, body, and soul. If we but use our God-given sense to regulate the affairs of government and family wisely and economically, this great world of ours will be one of plenty and beauty where the good will predominate over the evil and the children born in it will become men and women only a little lower than the angels—images of their Creator.

DISCUSSION.

Dr. Ira S. Wile, *New York City:* In reading the thoughtful paper of Doctor Knopf a number of thoughts suggested themselves. Birth control is recognized today as a factor in eugenic control. Some states take cognizance of the advantages of limiting the number of offspring in so far as defectives and criminals are concerned. The laws of numerous states permitting sterilization or asexualization place the seal of governmental approval upon the prevention of procreation in the interests of the public weal. Numerous regulations providing for the segregation of defectives represent crystallizations into law of the principle that the state has a vital interest in controlling the birth of certain types of citizens. States requiring a certificate of health previous to marriage point out a deep interest in the character of health of those who are to become parents. The underlying principle is the protection of the state from the development of undesirable children.

The law recognizes the interruption of pregnancy as legal and justifiable in order to save the lives of women suffering from tuberculosis, nephritis, cardiac diseases, or from conditions, whose fatal progress would be hastened through continued pregnancy, but the law holds it to be illegal to teach these same women how to avoid conception. It is manifestly contrary to every principle of modern preventive medicine that there should be such interference with the judgment and action of physicians where it seems most rational and medically sound to give advice as to the methods of preventing a condition containing a hazard to life.

Despite the existing laws, contraception is practiced and undoubtedly taught by members of the medical and nursing profession, as well as by midwives. What is equally important is the fact that contraceptives are sold in drug stores throughout the country without any interference, providing conscience is stretched and the instrumentalities are dispensed on the plea that they are agents for the prevention of disease.

It is known that in 1900 there were only three-quarters as many living children to each 1,000 potential mothers in the United States as in 1860. The reason for this decreased birth-rate is undoubtedly in a large part due to "the deliberate and voluntary avoidance or prevention of child bearing on the part of a steadily increasing number of married people, who not only prefer to have but few children, but who know how to obtain their wish" to quote the words of Dr. John Shaw Billings. At the present time, the practice of birth control is more or less limited to the more intelligent part of the population and indeed to those whose means would most warrant the development of large families.

Public health sees in poverty its great enemy and realizes that education is its most capable ally. The education of potential parents as to the methods of preventing conception may be regarded distinctly as a public health measure. From the standpoint of the welfare of the race, those interested in public health measures are more vitally interested in the vigor and quality of children born than in their absolute numbers. The birth of the most vigorous children, those least susceptible to disease, and possessing the greatest chance of living are the particular types of infancy in which health officers should be interested. The reduction of dysgenic types of offspring and the decrease of infants variously handicapped, whose care-needing existence lessens family vitality represent a considerable part of the public health problem.

The tremendous wastage of human life resulting from stillbirths, congenital diseases, malformations, puerperal injuries and infections, and economic pressures may be partially offset by a properly controlled system of dissemination of information concerning the limitation of offspring. The old doctrine of the survival of the fittest has been superseded by our more artificial and humanitarian program which permits the survival of even many of the weakest of the infantile population.

It is well known that the rate of infant mortality, as pointed out in the paper of Doctor Knopf, increases with the size of the family. To quote from Doctor Hibbs in his discussion of Infant Mortality: Its Relations to Social and Industrial Conditions, "However dangerous 'race suicide' and the declining birth-rate may be there can be little doubt that excessively large families is no remedy and however desirable a high rate of births may be, it is mere waste to bring children into the world faster than the laws of nature decree to be desirable." Race suicide is not due to limiting the number of births, but is determined by the ratio between births and deaths. From the standpoint of public health, it is a greater degree of race suicide to bring six children into the world and lose two or three than to have two born and reared. The social consequences of large families with the accompanying loss in lives and vitality have been sufficiently described, so that further comment is unnecessary.

From the standpoint of public health, it is important that a very sharp line of demarcation should be established between abortions and the prevention of conception. The interruption of pregnancy to destroy a developing ovum entails physical hazards to the woman which often adds to the mortality rate. At the same time this is equally the destruction of life as foeticide and, literally speaking, infanticide. According to DeLee, while abortion occurs oftener among the lower classes, criminal abortion is more frequent among the more educated classes.

Howard Kelly (Medical Gynecology, page 449) comments "to what extent the medical profession is responsible for the murder of the unborn" is shown by the methods that women employ to induce abortions upon themselves making use of antiseptic technic in which they obviously had been instructed.

The Report of the Special Committee on Criminal Abortions quoted in Textbook of Legal Medicine and Toxicology (Peterson and Haines, Volume II, page 92) "estimated that one-third of all pregnancies throughout the country end in abortions. This is estimated at not less than 100,000 yearly. A large number of these are criminal abortions from which the committee estimated that 6,000 women die yearly." A fact of this character merits careful consideration by a public health association with a view to pointing out to the intelligent laity and legislators the importance of differentiating between the prevention of conception, which carries practically no morbidity and certainly no mortality, and abortion, which may cause destruction of two lives.

Howard Kelley in discussing syphilis (Medical Gynecology, page 423) states "It is the recognized duty of all physicians in the presence of any contagious disease to protect others from the risks of infection. In the case of syphilis, where there is a question of its introduction into marriage, the physicians' protective duty embraces not only the prospective wife, but the children she may bring into the world and through them the interests of society." (Page 424.) After marriage has occurred "when a married man has syphilis the first indication is to prevent the contamination of his wife, the second is to guard against pregnancy." The interpretation of the term "guarding against pregnancy" opens up the question as to how this is to be accomplished without violating existing laws.

It is urged that the frank discussion of methods of contraception by physicians will lead to an increase of clandestine relations among unmarried girls by virtue of the new knowledge. Clandestine prostitution exists today and fear of pregnancy is not an impassible barrier. The development of a conscious morality, which is the greatest protective force, should not be based upon fear. Admitting for the sake of argument that the same degree of immorality might exist, there would be at least a decreased destruction of life for the women now illegitimately pregnant and the fetus to be destroyed. Fewer homes would suffer disgrace, foundlings would decrease in number, while an accursed bastardy would be greatly diminished.

I do not advocate, however, that knowledge concerning the prevention of conception should be given to the young, but merely to adults and only to those who are wedded. It cannot be denied that a law of this character would undoubtedly be broken just as is the present law today. The transmission of some facts with reference to contraception is constantly going on, but they emanate from polluted sources and reflect folk lore rather than intelligent medical opinion.

I do not favor the abolition of federal or state laws which deal with abortions, though owing to the weight of public opinion convictions for violations of these laws are remarkably limited in view of the large number of violations occurring annually. I believe and would urge that the federal and state laws be amended so that in effect the procuring of an abortion and the preventing of conception will be dissociated as acts not synonymous in character and meriting entirely different treatment. The procuring of an abortion should still be penalized. The prevention of conception should be permitted. The New York State law links prevention of conception and unlawful abortion, thus indicating the legality of certain types of abortion.

Because the state already recognizes its right to limit procreation among certain groups of the population, because the decrease in the birthrate will result in improved public health and the social economic improvement of the masses of this country, because prevention of conception would add to the health and racial betterment of the nation, I believe that the American Public Health Association should take a stand upon the subject of limitation of offspring. To this end, I urge that resolutions be passed favoring the amendment of federal and state laws, so that the words preventing or prevention of conception be eliminated thereform.

Dr. J. H. Landis, *Health Officer, Cincinnati, Ohio:* It goes without saying that we are all in favor of reducing the number of those who are physically, mentally and morally unfit and adding to the number of those who are physically fit, mentally sound and more highly developed morally.

The paper brings to our attention a number of facts that have long been recognized as true. No one will deny that the offspring of a tuberculous mother has a poorer chance of living than one from a mother without a wasting disease or that the healthy mother has a better chance of surviving pregnancy than has her diseased sister.

No one doubts that infant mortality is greatest among the offsprings of the ignorant, the poor, the underfed and badly housed, the tuberculous, the degenerate, the alcoholic, the vicious and the mentally defective.

Congestion and lack of air and sunshine have long been recognized as powerful predisposing factors in the dissemination of disease and death among those exposed.

The remedy suggested for all of these conditions is birth control. The remedy is directed towards the effects produced instead of being directed at the causes producing them.

I am unable to see how birth control is to solve the problems created by vice, poverty, ignorance and alcoholism while these conditions go on unchecked, and am unwilling to believe that the size of the family has anything to do with any of them with the possible exception of poverty.

The pride and glory of the medical profession is bound up in the word "prevention." Humanity owes us a far greater debt for sickness prevented than for sickness cured.

A multitude of causes are responsible for the high tuberculosis rates that prevail. The disease is one of the most contagious with which we have to deal. Nature's favorite method of removing the unfit, from any cause, is by the tuberculosis route.

The control of tuberculosis involves all of the factors active in producing individuals who are rendered susceptible by these factors, the quarantining of those who are spreading the disease and the care of those other members of the family rendered dependent. Birth control can play only a minor rôle in the control of this disease.

Birth control will not enlighten the ignorant, render the poverty-stricken affluent, transform the alcoholic into a total abstainer, make the vicious virtuous, or remove the cloud from the brain of the mentally defective.

Definite causes are combining to produce these results and the logical point of attack is the combination of causes.

The ignorant can be educated; the poor made more thrifty; the vicious forcibly restrained; and the mentally defective rendered incapable of reproducing their kind.

The prevalence of typhoid fever is an index to the purity of a community's water and milk supply. Filtration of water and pasteurization of milk have solved the typhoid fever problem in those communities in which they have been efficiently carried on.

Vice, crime, tuberculosis, poverty, degeneracy, alcoholism, ignorance and feeble-mindedness are as distinctly due to particular preventive causes as typhoid fever is to impure water and milk, and it appears to me that birth control would be as impotent to control the first set of conditions as it would be to control typhoid fever.

Dissemination of the knowledge of birth control would, in my humble judgment, decrease the number of fit and increase the number of unfit for the reason that the knowledge would be applied by those capable of producing normal children and ignored by those unfit individuals who are under the guidance and control of the most powerful primal instinct.

Dr. J. N. Hurty, *Indianapolis, Ind.:* We, the people are suffering from many delusions. Nearly everyone entertains the delusion, that they can violate the laws of nature, abuse their bodies, bring on disease and degeneracy, and then find repair in a medicine. It is a fool idea, yet it is very general. There are other delusions. There is only one way to improve the human race, and that is the natural way. The first high point of interest in the paper is when Doctor Knopf says—"My appeal is not a plea for reducing the population but for increasing its vigor by reducing the number of the physically, mentally and morally unfit and adding to the number of the physically strong, mentally sound and higher morally developed men and women." Certainly no one on any score can object to this. The idea is practical, pure and lofty. If general birth control will help it onward, even a little bit, then I am for general birth control. I suppose no one would advocate the raising of idiots or physically deformed people, yet when it is proposed not to raise them, through the practical application of sterilization or segregation, up goes a howl from the prudes which is of a character likely to provoke emesis. It is important and interesting to learn that when tuberculosis appears in a large family, it is generally numbers 5, 6, 7, 8 or 9 of the children that are stricken. This is indeed significant, and I believe it to be true. When I read this in Doctor Knopf's paper I made some inquiries of two men who have done a great deal of tuberculosis work, and they confirmed it and said they believed it was true. Again, Miss Duke's Johnstown figures speak loudly against families of above four children. For a pair to have more is generally to invite sickness, invalidism and death, and if we will stop to think and look around among the prosperous, great and strong people as a rule (of course there are exceptions) they do not have families of more than four and generally about two. I do not believe that this condition has been brought about by continence. Surely pregnacny is contra-indicated in a tuberculosis woman unless it is desirable to kill her and add to the number of pitiful motherless babies. A husband who cannot be continent with a tuberculosis wife is a sorry specimen of manhood and truly such specimens are many. And here I think it proper to say that birth control will not likely ever be a resultant of voluntary continence. Like education and monogamy, it must be forced upon most of the animals we call men. An important point made by Doctor Knopf is, "would or could a syphilitic or gonorrhoeic parent know how to prevent conception during the acute and infectious stages of his or her disease, there would certainly be less of congenital syphilis, less blindness from gonorrhoeal infection." If these ends can be gained, even in slight degree, by birth control, I'm for it strong. I remember the doctor in "Damaged Goods" says—"It is better to have fifty sound and whole men than to have a hundred, sixty or seventy of whom are more or less rotten."

That is an important interrogatory in the paper which reads—"What is the physiological effect of voluntary artificial restriction of the birth-rate of the offspring?" The answer is satisfactory, for the reports from Holland, where the medical profession have openly approved and helped to extend artificial restriction, are to the effect that the morbidity and mortality rates have improved more rapidly than in other countries. Holland also supplies data to prove that rational birth control does not mean race suicide, but on the contrary, race preservation and strengthening. Doctor Holt, as quoted by Doctor Knopf, talks wisely when he says—"Conscious and limited procreation is dictated by love and intelligence; it improves the race. Unconscious, irresponsible procreation produces domestic misery and half-starved children. Conscious procreation of human lives elevates man to the gods; unconscious procreation degrades man to the level of brutes." It is plain that Doctor Knopf has contended and written well. Conscientiousness in his contention is apparent. I am sure good will follow his effort.

Dr. W. L. Holt: I should like to call your attention to the fact that we as a nation, like all the civilized nations, are already practicing birth control; but in a very stupid and mistaken way. Namely just that part of the population which is called "the upper class," which is undoubtedly superior physically and mentally as well as financially and accordingly produces the most desirable children and ought to produce at least its share of the future generation, is practicing birth control to such an extent that the old families are dying out; whereas the inferior part of our population, which is also financially least able to raise four children, is raising four and more. What could be more stupid?

Dr. Louis I. Dublin, *New York City:* The other day I contributed a paper in another section on the commoner errors in statistical work. I wish I had had Doctor Knopf's paper at my disposal for I could have used it very profitably for my text. I do not recall any paper that I have read for some time that is more subject to criticism on the score of method than the paper we have just heard. I believe it is fundamentally erroneous because of the emotional attitude of the writer which has caused him to draw general conclusions from an examination of only a very limited part of his subject. His emphasis is entirely in the wrong place. There is altogether too much birth control now and what the community needs is emphasis on birth release by the healthy, capable and self-respecting elements of the community.

There is time only for one word and I want to limit that to the story of France. In France, we have today a sorry spectacle of the results of birth control. The lesson is obvious. France is today crying for men; for men who were either not born or died at an alarming rate in infancy or later of tuberculosis. The attitude of mind which is engendered by a nation-wide policy of birth control ultimately brings about more infant mortality and more tuberculosis because of the general weakening of the stock which directly results therefrom.

A Member: It strikes me that the whole question resolves itself into who should marry and who should not marry. Unless we have some laws regulating marriage, to teach young men and young women the nature of the social diseases and the conditions necessary for a good physical body, why, we will have tuberculosis, we will have degenerates, we will have idiots and imbeciles and our penitentiaries and almshouses and every other penal institution will be filled. The whole question is prevention; I believe strictly in the doctrine of heredity. Heredity, environment and education is the triangle that leads to greatness. If we do not hover around those three points, we will never succeed. We know that if two degenerates marry, they beget degenerate children, beget imbeciles. If an imbecile marries a normal person, half of the children will be imbeciles or degenerates, and we have the records of criminality and all those deficiencies and the penalty is the result of improper marriage. Teach the laws of nature and our mothers will demand that their daughters don't marry a man who has in his veins the virus of a venereal disease circulating through his body.

Dr. John W. Trask, *United States Public Health Service, Washington, D. C.*: The subject may be approached from a number of different angles. During the discussion a thought has occurred to me which may be worth presenting. What is the common reason for wanting the population to grow? What is at the bottom of the more or less prevalent idea that it is meritorious to be the parent of many children? It has occurred to me while sitting here that chambers of commerce and boards of trade want the populations of their respective cities to increase—the faster, the better—because it is to their interest to have more individuals to sell things to, more individuals to whom they can sell dry goods, clothing, and groceries, more individuals to whom to sell houses and land. The greater the population the more business will be done and the greater the increase in the value of real estate. On the other hand, those interested in affairs of state may want the population of their country to grow that there may be a larger group from which to draw an army for purposes of defence or perhaps offence. Birth control is opposed in a way to the interests of business and of the holders of real estate. Nor will it be the best national policy where a growing population and large armies are necessary as a protection against invasion or oppression by lawless peoples. However, it would seem at least worthy of consideration whether the best conditions would not be attained by families commensurate in size with the household incomes and by nations commensurate in population with their areas, economic conditions and natural resources. Better people, living cleaner, healthier and more rational lives, and not more people, would seem to be the logical objective.

Dr. Knopf:* My first duty is of course to thank you all for the very kind attention you have given to my paper on a rather unusual and, in some circles, rather unpopular subject. It shows that you have come here determined to listen and then to judge—to accept my ideas, to reject them, or to suspend judgment.

Dr. Ira S. Wile agrees with me so thoroughly that I see very little reason to take up time in referring to his paper, except to thank him for his coöperation and particularly for the strong opinion he has expressed concerning the urgent need of recommending an amendment of the federal and state laws to the effect that the procuring of an abortion and the prevention of conception will be disassociated, and considered as acts meriting entirely different treatment. We all agree that producing an abortion for no other reason than to rid a healthy mother of an unwelcome child is a crime and should continue to be considered as such.

Doctor Landis' paper is a little surprising to me. When the doctor says in today's discussion that birth control will not do away with our social evils, will not render the poverty stricken affluent, not transfer the alcoholic into a total abstainer, nor remove the cloud from a mentally defective, he is but partially right. Birth control has enlightened the ignorant in Holland and has rendered the poverty stricken not affluent but economically more comfortable; it has decreased crime, immorality, and illegitimacy. At the same time, I do not for a moment think that birth control alone will do away with the procreation of the feeble-minded, idiotic, half insane, chronic alcoholics, or chronic criminals. Birth control is not a panacea for all the ills of society, it is only one measure toward a saner and happier man-, woman-, and childhood. To minimize the harm to society and to future generations produced by the just mentioned class of unfortunates, the state should step in and demand medical examination of both the prospective father and mother, prior to granting them a marriage license. Even with our present limited but growing knowledge of the laws of heredity we should be able to prevent many of the evidently unfit from becoming parents and save many a child of tomorrow from a handicapped existence—a burden to himself and others.

As already indicated in my paper, there is a certain class so mentally and physically diseased that sterilization, or at least segregation, must be resorted to. Doctor Landis is absolutely right when he says that "A multitude of causes are responsible for the high tuberculosis rates that prevail." If I did not think that, would I have devoted twenty-five of the best years of my life to the combat of tuberculosis? Bad housing conditions, bad factory hygiene, overcrowded and unhygienic schools, useless studies and not enough outdoor play for the children, child labor, ignorance on the part of the laity, the late diagnosis of the disease on the part of the profession, failure of rational treatment and lack of institutions, are some of the multiple causes responsible for the high tuberculosis morbidity and mortality rate.

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* This discussion has been revised and enlarged since its presentation.—Editor.

Those of my colleagues who have honored me by their steadfast friendship and constant cooperation will bear me out when I say that I have done my best to help to remove these causes during years of conscientious labor. And when you ask me why I became suddenly interested in birth control, apparently so foreign to my specialty, I will tell you. After all it was not so sudden as it seems. I have worked among the tuberculous for a quarter of a century, the rich and the poor, in palatial homes and humble cottages, in dark and dreary tenements and over crowded hospitals; I have witnessed the tears and sufferings of many a tuberculous mother to whom I have had to decline help because it was too late to prevent. The despair of the poor, frail creature at the prospect of another inevitable confinement, and later the sight of a puny babe destined to disease, poverty, and misery, have opened my eyes to the utter immorality of thoughtless procreation; and my experience has been extended over only one disease of the masses.

I have approached the subject of birth control after deep reflection and with due reverence for all that is sacred in man's physical, moral, and religious life. I now believe in it with all the sincerity and earnestness I am capable of. I believe in it because by its aid there will rise a generation of men physically, mentally, and morally fit, and children free from disease and prepared to take up the struggle for life.

I must revert once more to my friend, Doctor Landis' discussion of the tuberculosis problem. I said he was absolutely right in the statement that a multitude of causes were responsible for the high tuberculosis death rates that prevail. But I say with equal emphasis that he is absolutely wrong when he says in the following sentence that "the diseaseis one of the most contagious with which we have to deal." It is not the most but the least contagious and should always be classed with communicable diseases. It should not be considered as most contagious like smallpox for example. On the contrary, strictly speaking; it is not contagious at all, as the word contagious comes from the Latin *contingere*, "to touch." The touch of the honest, conscientious, and clean consumptive is no more contagious than that of a healthy person. This can hardly be said of the smallpox patient, be he ever so clean. It is best for an unvaccinated individual never to touch him, and still better to stay away from him as far as possible.

I would consider it a most regrettable thing if it should go out to the public that a distinguished member of the American Public Health Association has suddenly declared tuberculosis to be the most contagious of diseases. We have already too much phthisiophobia which makes the lot of the unfortunate consumptives hard enough.

For the kindly words said by my good friend, Doctor Hurty, I am deeply grateful. He is always progressive, fearless, and outspoken. He agrees with me so thoroughly that I feel he will do his share toward a better understanding of the problem under consideration and be an enthusiastic supporter of the all important movement for the betterment of mankind, which he loves so much.

To the member whose name I could not catch and who maintained that the whole question resolves itself into who should marry and who should not marry, I wish to say that it was merely for lack of time that I did not touch on this subject in my paper. That I strongly advocate a medical examination of the man as as well as the woman prior to granting a marriage license, I have already said in my reply to Doctor Landis' criticisms. Much unhappiness and misery could be avoided by such obligatory examination and if we could add to our institutions of learning a school of parenthood with obligatory attendance for every one desiring to enter the matrimonial state, we would add still more to the happiness and prosperity of the individual and the community at large.

Now a word to our Catholic friends and those of other faiths who are so strongly opposed to contraception and limiting family increase.

Let us have no word of bitterness or reproach because millions of devout Catholics hold these views. Let us not antagonize either the Catholic priest or layman, who have a right to their convictions as much as we have to ours. This is a purely scientific meeting, composed of men who should not have, and I hope do not have, any hatred in their heart because of differences of opinion regarding purely religious views. Therefore, in reply to the somewhat passionate remarks of the distinguished statistician of the Metropolitan Life Insurance Company who questions the accuracy of my statistics and all of my statements, and says that it is all fundamentally erroneous, I wish to reply with less vehemence. I would calmly state that if we do not believe in official statistics of one kind, we cannot believe in official statistics of another kind. Mine were prepared by the government in Holland and by the United States government and officials of various cities. The gentleman makes the statement that because of my emotional attitude toward the question of birth control, my conclusions are fundamentally erroneous and drawn from an examination of only a very limited part of my subject. Mr. Dublin is not a physician; he is a Doctor of Philosophy, and this perhaps is an excuse for finding fault with my emotional attitude. My experience as a physician has brought me into contact not only with the happy and well-to-do but also with the poverty stricken and the mentally and morally diseased, with the unfortunate girl-mother and our unfortunate sister the so-called prostitute, and last but not least, with the honest but poor and ignorant mother of a large family who is a slave by day and by night. I have made earnest attempts to lessen the misery caused by thoughtless procreation, and I may perhaps be forgiven if I have approached the subject with deep conviction and not without emotion. We physicians cannot, and God forbid that we ever shall, deal merely with cold figures and statistical facts. We love science, yes, and accuracy in science and statistics, but this does not prevent us from feeling with our patients in their sufferings of mind, body, or soul.

I do not at all disagree with the gentleman when he speaks of birth release by the healthy and well-to-do. In my paper I have referred to this and also believe to have distinctly shown that I do not plead for race suicide but most emphatically for race preservation and multiplication of the best and noblest, physically, mentally, and morally. What I think of France of today, I have already said, and when the gentleman says that France is crying for more men, I might first say that the quality of the French soldiers has made up for the quantity. Russia has had and has the most men. It does not cry for more men, and still its achievements do not compare, at least not up to this day, with the achievements of France.

Lastly, when Dr. Dublin says: "The attitude of mind which is engendered by a nation-wide policy of birth control, brings about more infant mortality and more tuberculosis because of the general weakening of the stock which directly results therefrom", I most thoroughly disagree with this argument. My personal statistics regarding the frequency of tuberculosis among the later born children in large families have been, as you have heard, corroborated by Dr. Hurty's investigations; and all physicians know that women, particularly those of the working classes when worn out by frequent pregnancies, are more subject to tuberculosis than almost any other class of people. How then can Dr. Dublin believe that birth limitation would cause more tuberculosis? In Russia, where the word birth control is unknown, tuberculosis and infant mortality are the highest of all civilized countries. On the other hand, in Holland where we might speak of nation-wide birth control, as already stated in my paper, after forty years of this policy there is less infant mortality, an increase in population, a better physique, and a higher morality. Furthermore, there has not been a general weakening but a general improvement in the strength of the stock which is shown by an increase in stature and increase in the longevity of the population at large.

My good friend, Assistant Surgeon-General John W. Trask, has admirably answered the question as to what, aside of the war and its demands for more men, is the common reason for wanting the population to grow. It is a splendid answer and I could not possibly improve on it but wish to thank him most heartily for what he said. And here I cannot help saying one word which, however, I hope may not be misunderstood. I am an American to the core of my being, but my cradle stood in Germany whose people I love as warmly as ever; and yet I cannot help feeling that the over-population of Germany has been one of the vital causes of this disastrous war which has brought so much misery to all humanity. Prof. Robert J. Sprague, of the Massachusetts Agricultural College, expressed this view very strongly the other day at the meeting of the Genetic Association when he said: "The barbaric birth-rate of Germany hemmed in as she is by the other nations, made the great war inevitable and will, if it keeps up, make war forever in the future. Some believe this will work eugenically for the survival and predominance of the strongest and best race, but this is still a mooted question. The survival of the merely strong may result in the survival of the strong animal. Pressure of population on subsistence and area develops brutality, selfishness, and disregard of human life. It crushes leisure, generosity, and art and makes impossible some of the finest virtues of the race."

I have already said how anxious I am that we may treat this subject as a scientific one and that we should only have in view the highest ideal, namely, a normal increase of population concomitant with our resources and an improvement of the quality of our population; in other words, we should strive to render the lives of man, woman, and child more healthy and more happy, and economically secure. My personal belief is that we shall thereby become more highly developed spiritually and approach more rapidly towards the millennium. When at last an enlightened government will permit contraception to be taught where it is likely to be productive of the most good, when in years to come we can show our Catholic brethren and all those who oppose us now that because of judicious birth control resulting in a rational family limitation, we have decreased poverty, disease, and crime and have produced a better generation of men and women, better equipped physically, mentally, and morally for life's mission, in short, men worthy to be called true citizens of a great republic, then I am sure our Catholic friends and other opponents will see that after all we have not been so wrong and they may then be willing to follow along the same lines of teaching rational birth control.

Nature's forces are blind. She creates without thought of provision for the offspring. Think of bacterial life if it had remained unchecked by the genius of a Pasteur, a Koch, a Lister; of the insects, such as the yellow fever and malaria-spreading mosquitoes, if unchecked by a Reed and a Gorgas! I could continue the theme of man's triumph and control over nature indefinitely if I were to enter into the field of agricultural and industrial science. I could tell you of the battles of the Australian farmer with the rapidly multiplying rabbit. Here nature's blind tendency to procreate devastated the fields destined to nourish the population. If non-interference with thoughtless nature comprises one of the tenets of the religion of others, to me man's intellectual control over nature's blind forces and nature's thoughtless procreation of undesirable bacterial. insect, or animal life, and his powers to bring forth more useful products and make life for man, woman, and child not only more bearable but even more beautiful and glorious, are among the greatest proofs of the existence of God's power in man. But the greatest of all achievements, the most divine gift which God has bestowed upon man, is conscious procreation. To me, judicious birth control under the guidance of the best and ablest among our own profession, among the clergy and the sociologists, based on the highest conception of sanitary, medical, moral, ethical, and economic reasons, can well be considered a spiritual asset which will uplift the race.

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A MEDICAL COMMISSION, BUT NO MEDICAL MAN ON IT.

According to the newspapers, President Wilson has nominated as members of the workmen's compensation commission, to administer the federal Employees' Liability Act, the Reverend R. McMillan Little of Swarthmore, Pa., a preacher in the United Presbyterian Church; a Mrs. Axtell of Bellingham, Wash., a social worker and a defeated candidate for Congress, and a J. J. Keegan of Indianapolis, a member of the International Association of Machinists, formerly a member of the state legislature, and more recently a commissioner of conciliation in the Department of Labor. The first of those mentioned above is stated to be a Republican, the second a Progressive, and the third a Democrat; none is a physician. Probably 90 per cent. of the work of the commission will be medical in character.—*Journal of the American Medical Association*, January 27, 1917.

A YEAR'S WORK IN HAY-FEVER-PREVENTION IN THE UNITED STATES

WILLIAM SCHEPPEGRELL, A. M., M. D.,
President, American Hay-Fever-Prevention Association; Ex-President, American Academy of Ophthalmology and Oto-Laryngology, New Orleans.

Read by title before General Sessions, American Public Health Association, Cincinnati, Ohio, October 27, 1916.

THE American Hay-Fever-Prevention Association was organized for the education of the public in the relationship of pollens to hay-fever, the inauguration of legislative methods for the eradication, as far as practicable, of the weeds that cause this disease, and for the scientific study of the best therapeutic methods.

Education and legislation in this case, as in other important sanitary measures, are closely allied. Without proper education in the advantages and necessity of such measures, legislation is hard to enact, and difficult to enforce. Without legislation, however, only partial benefit is obtained from education, as there are always many persons who will respect their neighbor's rights and health only to the extent enforced by the law.

Education in the relationship of pollens to hay-fever has made excellent progress during the past year. The public was first impressed with the fact that the principal causes of hay-fever in the United States were the ragweeds, whose pollen during the months of August and September filled the atmosphere with their irritating pollens, and that these, as well as most of the other plants which cause hay-fever,* had already been outlawed by the agricultural interests.

The subject was presented to the medical profession through many of the principal journals, such as the *Journal of the American Medical Association*, the *New York Medical Record*, the *New York Medical Journal*, the *Journal of the Southern Medical Association*, the *New Orleans Medical and Surgical Journal*, and through a large proportion of the bulletins of the various state boards of health.

The general public was made familiar with the relation of pollen to hay-fever through many of the most prominent periodicals, such as the *Country Gentleman*, *Collier's*, the *Florist's Exchange*, the *Outlook*, the *Musical Courier*, the *Rural New Yorker*, the *Scientific American*, *Current Opinion*, etc.

Many of the most prominent daily papers published articles on this subject, these being taken from the literature of this Association, from the bulletins of the boards of health and from the articles in the medical journals. Among these are the following: The *Pittsburg Dispatch*, *Utica*

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*The principal hay-fever weeds are described in "Hay-Fever: Its Cause and Prevention," Scheppegrell, Journal of the American Medical Association, March, 1916.

Herald Dispatch, Knoxville Sentinel, Hartford Daily Courant, New York Herald, Birmingham Age-Herald, Wilmington Morning News, Atlanta Constitution, Augusta Chronicle, Evansville Daily Courier, Minneapolis Journal, Kansas City Star, St. Louis Republic, Omaha Bee, New York American, Albany Journal, Western North Carolina Democrat, Columbus Dispatch, Providence Bulletin, Dallas News, Houston Post, Texas News, Milwaukee Sentinel, Washington Times, Detroit Journal, Cleveland Leader, Charleston News and Courier, Nashville Banner, Saginaw News, Norfolk Ledger, Elizabeth Journal, Ogdensburg News, Rome Sentinel, Post Intelligencer, the New Orleans Times-Picayune, Item and States.

The United States Public Health Service published the report of this Association on "Hay-Fever and Its Prevention,"* which proved of great advantage in the educational part of this work. It stamped the approval of the Public Health Service on efforts to eradicate the cause of hay-fever, and it enabled the Association to supply the popular demand for literature on this subject.

In New Orleans, through the efforts of this Association, an effective grass-weeds ordinance was passed last January. The public had been prepared by popular lectures and newspaper articles on the relationship of weed-pollen to hay-fever, so that the new ordinance was passed without opposition.

Through the efforts of Dr. W. T. O'Reilly, president of the New Orleans Board of Health, and Commissioner E. E. Lafaye, of the Department of Public Property, this ordinance was thoroughly enforced and resulted in a general clearing up of the weeds on the streets and vacant lots. The requirements of this ordinance were as liberal as its object would permit and the penalty made extremely low, so that, although there were more than twelve hundred affidavits issued for violations of this ordinance, it was legally contested in not a single case.

As this ordinance has proved very effective, it is recommended to all city boards of health interested in the destruction of weeds from both a sanitary and civic standpoint. The following is a copy:

Mayoralty of....................
City Hall,..............191
Calendar No.............
No....... COUNCIL SERIES.

An ordinance for the better protection of the public health, and particularly to prevent the spread of disease.

SECTION 1. Be it ordained by the Council of the City of.........., That:

(1) The tenant or occupant of any leased or occupied premises, lot or other area shall not permit weeds or grass over one foot in height to grow or stand on the premises, lot or area leased or occupied by him.

(2) The person, firm or corporation owning any premises, lot or other area, not leased or occupied by another, shall not permit weeds or grass over one foot in height to grow or stand on such premises, lot or other area so owned.

(3) The tenant or occupant of any leased or occupied premises, lot or other area shall not permit weeds or grass over one foot in height to grow or stand on the sidewalk abutting the premises, lot or other area leased or occupied by him.

(4) The person, firm or corporation owning any premises, lot or area, not leased or occupied

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*Scheppegrell, United States Public Health Reports, July, 1916.

by another, shall not permit weeds or grass over one foot in height to grow or stand on the sidewalk abutting such premises, lot or area so owned.

(5) A firm or corporation having franchise rights or privileges on the streets shall not permit weeds or grass over one foot in height to grow or stand on any street or area or any part thereof, which, by the terms of its franchise, it is bound to care for or to keep in good order, condition or repair.

(6) For the purpose of enforcing the provisions of this ordinance, a corporation shall be deemed to be represented by its president, or in his absence by its vice-president, or in the absence of both by the officer or individual in charge of the affairs of the corporation, and such representatives shall be held responsible and punishable for any violation by the corporation of the provisions of this ordinance. The owner shall be deemed to be the person, firm or corporation appearing as owner upon the records of the Conveyance Office in the City of ....

(7) Each of the members of a firm shall be held responsible and punishable for any violation by the firm of the provisions of this ordinance.

(8) For every violation of any of the provisions of this ordinance, the person, firm or corporation responsible shall, on conviction for the first offense be punished by a fine of not less than $1 nor more than $25, and for the second and each subsequent offense not less than $5 nor more than $25, and in default of payment of the fine, in either case, by imprisonment in the county prison for not less than five days nor more than thirty days, or both, in the discretion of the court having jurisdiction.

SECTION 2. Be it further ordained, etc., That all ordinances and parts of ordinances in conflict with the provisions of this ordinance be and the same are hereby repealed.

Adopted by the Council of the City of ...., 191 .

....
Clerk of Council.

Approved.........., 191 .

....
Mayor.

A true copy:

....
Secretary to the Mayor.

The efforts of the American Hay-Fever-Prevention Association have been officially endorsed by the following state boards of health: Alabama, Arkansas, Arizona, California, Colorado, Connecticut, Delaware, Florida, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Maine, Massachusetts, Michigan, Minnesota, Nevada, New Hampshire, New Mexico, New Jersey, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming. These endorsements proved of great benefit in the educational part of the work as it indicated the national interest in hay-fever eradication.

Much interest has also been shown by many of the municipalities in this work. In Asheville, N. C., for instance, the Board of Trade voted $700 to assist in the campaign against hay-fever weeds. Rochester, N. Y., through the efforts of Messrs. Herbert W. Pierce, commissioner of public works, R. Andrew Hamilton, commissioner of public safety, and Joseph M. Quigley, chief of police, and others, considerable work has been done. The Chamber of Commerce placed on exhibition the hay-fever weeds listed by this Association and the committee of ladies had similar sets placed on exhibition in the principal department stores.

Chicago also, through the efforts of Dr. Willis O. Nance, alderman of the Sixth Ward, instituted active measures against the hay-fever weeds. Similar efforts were also made in San Francisco and Pasadena, Cal., New Haven, Conn., Jacksonville, Fla., Omaha, Neb., Charleston, S. C., Salt Lake City, and Ogden, Utah, Huntington, W. Va., Maplewood, N. J., Philadelphia, Pa., Memphis, Tenn., Erie, Pa., and probably in many other cities of which we have no official report.

Summing up the results of a year's work, we would state that the educational part has been a great success. We have familiarized the public to a large extent in the relationship of weed-pollen to hay-fever, and its assistance in their eradication is becoming automatic. In New Orleans, for instance, at the commencement of this campaign, 90 per cent. of all the reports of violations of the grass-weeds ordinance came through the official inspectors. During the months of August and September, nearly 40 per cent. came from other persons in the interest of hay-fever subjects.

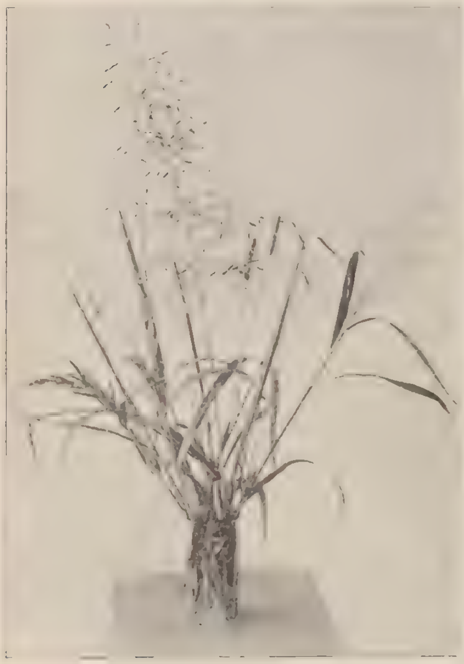

FIG. 1. Group of hay-fever grasses. The pollen of the grasses form the chief cause of spring and summer hay-fever and rank next to the common rag-weed (Ambrosia elatior) as a cause of hay-fever generally. The group contains: Meadow grass (Poa annua), Bull grass (Paspalum vasyanum), Bermuda grass (Capriola dactylon), Smut grass (Sporabulus angustus), Johnson grass (Andropogon halapense), Feather grass (Leptochloa filiformis), Fox-tail grass (Chaetochloa glauca) and Cockspur grass (Panicum crus-galli).

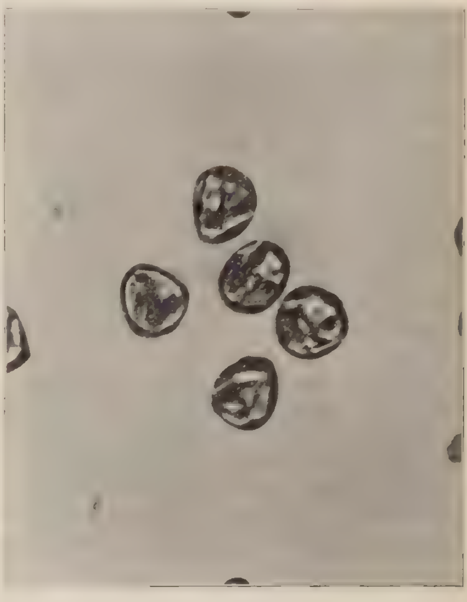

FIG. 2. Pollen of Bull grass (Paspalum vasyanum). Magnified 500 diameters. Its large size (40 microns) limits its potential area.

The legislative part of hay-fever eradication has also made progress. New Orleans has enacted an effective ordinance and other cities will probably do so at an early date. We have, for instance, a report from the health officer of San Francisco, that an ordinance, on the lines of the one suggested by this Association, will probably be adopted, and requests for copies of this ordinance have been received from many cities. The educational part of this work, therefore has advanced to such an extent that the enactment of suitable weed laws in cities generally will not prove difficult.

It is important, however, in preparing such ordinances that the requirements should not be too drastic. In a prominent city, for instance, there is at present an ordinance requiring the grass to be kept below four inches, the results of which is continual legal opposition to its enforcement. We have made the limit twelve inches, which is sufficient to prevent the pollination of most hay-fever weeds and is easily enforced. The penalty also should not be so high as to encourage litigation. We have found a penalty of $1 for the first offense, and increasing penalties afterwards, give good results.

We have not thus far attempted state legislation for the control of hay-fever weeds, but this is a question of the near future. The following states already have laws requiring the cutting of certain weeds that are injurious to agriculture: Alabama, Arizona, California, Connecticut, Idaho, Illinois, Kentucky, Michigan, Missouri, North Dakota, South Carolina, South Dakota, Oregon, Ohio, Pennsylvania

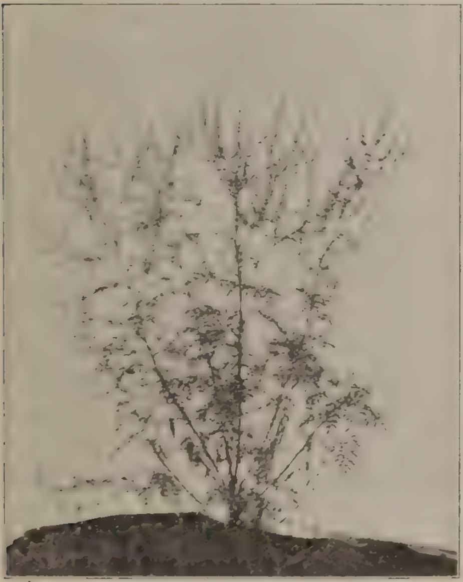

Fig. 3. Common rag-weed (Ambrosia elatior) the principal cause of autumnal hay-fever in the United States.

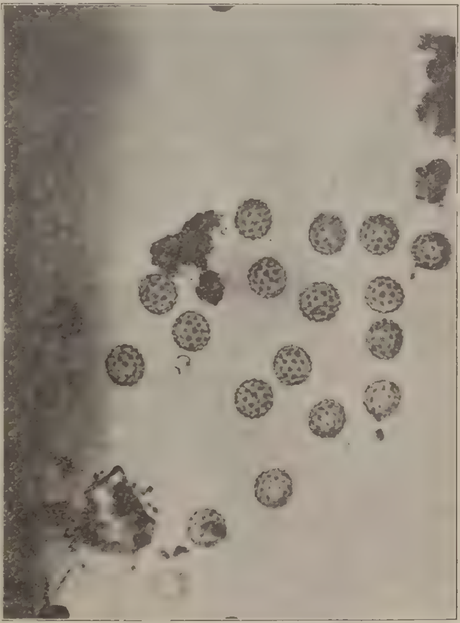

Fig. 4. Pollen of Common rag-weed (Ambrosia elatior). Magnified 500 diameters. Photomicrographed from atmospheric-pollen plate.

and Washington. In these states it will require but little change to include the weeds which are the principal cause of hay-fever. Similar laws in the remaining states will, no doubt, be enacted as soon as the importance of the subject, from both an agricultural and sanitary standpoint, is more fully understood.

The importance of having the country assist the cities in the work of hay-fever eradication should be well understood. As long as the winds are below ten miles per hour, the pollen is borne but a short distance and the cutting of neighboring weeds is quite effective. When, however, the wind velocity reaches fifteen or more miles per hour, some varieties of pollen are carried several miles.

This has been determined by the records of our atmospheric-pollen plates, which have been exposed during the whole of the past hay-fever season. These show that even during the active pollination of the ragweeds, the pollen count per square centimeter for twenty four hours was not more than 3 to 8 per cent., but quickly rose to 60 to 100 per cent. during the prevalence of a wind of twenty miles per hour. The low count, which was the result of the extensive weed-cutting in New Orleans, was not enough to cause many cases of hay-fever, but the higher number was sufficient to develop it in many persons sensitive to this pollen and who had not suffered during the early part of the season.

The investigations of our Research Department have demonstrated that there are two hay-fever seasons in the United States. The first being from May to July and the second from August to September.* The first is due to the pollen of grasses (Fig. 1), and weeds within the cities and whose potential area is so limited on account of the large size of the pollen (30 to 55 microns, Fig. 2) that the eradication or even cutting of these weeds will give entire relief. In New Orleans, for instance, the early form of hay-fever has been practically eliminated by the rigid enforcement of its grass-weeds ordinance.

Fall hay-fever, East of Kansas, however, is principally (85 per cent.) due to the common ragweed (Ambrosia elatior, Fig. 3) whose pollen (Fig. 4) is so light and buoyant (15 microns in diameter) that it is carried several miles by winds of fifteen or more miles per hour. While, therefore, we can eradicate the spring and summer hay-fever by municipal efforts, entire eradication of fall hay-fever requires coöperation of both town and country for its complete success.

In conclusion, we would impress the importance of educating the public in hay-fever-prevention. The large number of hay-fever subjects in the United States, constituting about 1 per cent. of the population who suffer from this disease, are entitled to relief from both a sanitary and economic standpoint, and education in this case means active coöperation in hay-fever eradication.

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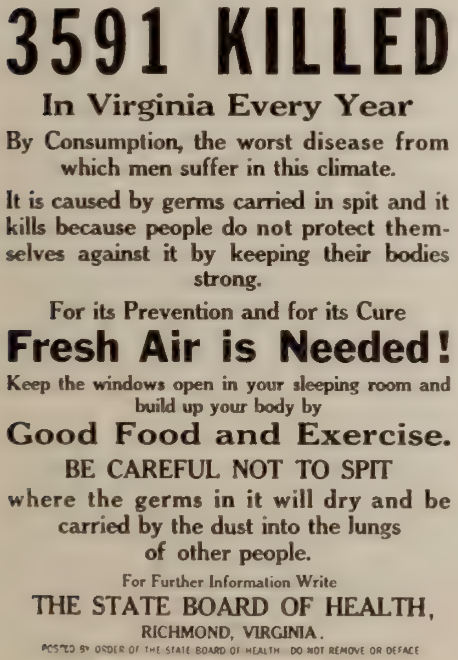
*The hay-fever seasons for each state are described in "Hay-Fever and Its Relation to Seasons, Occupations, Sex and Color," Wm. Scheppegrell, New York Medical Journal, December, 1916.

PREACHING HEALTH ON THE HIGHWAYS.

ENNION G. WILLIAMS, M. D.,
State Health Commissioner of Virginia.

THE same knowledge of human nature that prompted pioneer advertisers to utilize the street-cars long ago led the makers of farm implements and the venders of patent medicines to tack their signs along the roadsides. They knew that men would drive or ride by in a state of mental idleness and would be certain to read any attractive signs that might be posted conspicuously by the road. Our Virginia Board of Health learned its lesson some years ago from these advertisers and, from time to time, has been placarding the roads and the stores. Our first venture in this line was a pasteboard smallpox warning, sent through the mails to the postmasters in rural Virginia, with the requests that it be posted conspicuously on the store-porches. This was followed by a like warning on typhoid fever. In 1912, when the model vital statistics law went into effect, we decided to use the cross roads as well as the stores, and accordingly printed many thousand posters on muslin. These were distributed to the local registrars, and they were generally tacked up where thousands of Virginians saw them.

Early last spring we had occasion to do some intensive community work against malaria and, to aid our field men, we issued a pasteboard malaria placard similar in general design to those we had used as warnings against typhoid fever and smallpox. These were placed along all the roads our men traveled. As one of our investigators had occasion to pass along a road so placarded a few weeks afterward, he found that many of the placards had been torn down and effaced by boys. Much valuable work was thus undone.



3591 KILLED

In Virginia Every Year

By Consumption, the worst disease from which men suffer in this climate.

It is caused by germs carried in spit and it kills because people do not protect themselves against it by keeping their bodies strong.

For its Prevention and for its Cure

Fresh Air is Needed!

Keep the windows open in your sleeping room and build up your body by

Good Food and Exercise.

BE CAREFUL NOT TO SPIT

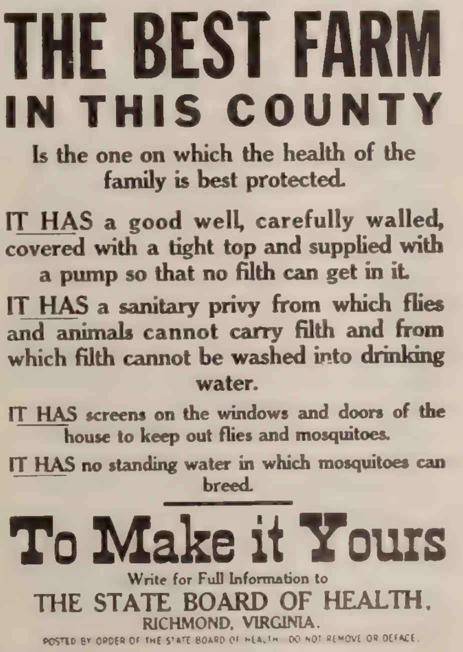
where the germs in it will dry and be carried by the dust into the lungs of other people.

For Further Information Write

THE STATE BOARD OF HEALTH,

RICHMOND, VIRGINIA.

POSTED BY ORDER OF THE STATE BOARD OF HEALTH. DO NOT REMOVE OR DEFACE



THE BEST FARM

IN THIS COUNTY

Is the one on which the health of the family is best protected.

IT HAS a good well, carefully walled, covered with a tight top and supplied with a pump so that no filth can get in it.

IT HAS a sanitary privy from which flies and animals cannot carry filth and from which filth cannot be washed into drinking water.

IT HAS screens on the windows and doors of the house to keep out flies and mosquitoes.

IT HAS no standing water in which mosquitoes can breed.

To Make it Yours

Write for Full Information to

THE STATE BOARD OF HEALTH.

RICHMOND, VIRGINIA.

POSTED BY ORDER OF THE STATE BOARD OF HEALTH. DO NOT REMOVE OR DEFACE.

PLEASE POST

SMALLPOX

Now Prevails in This County

IF YOU DON'T WANT TO HAVE IT,
If you want to escape the Danger, Suffering, Inconvenience and Expense of the Disease

Be Vaccinated

YOU AND YOUR FAMILY

If you are properly vaccinated you cannot have the disease.

There is no other sure way to avoid it.

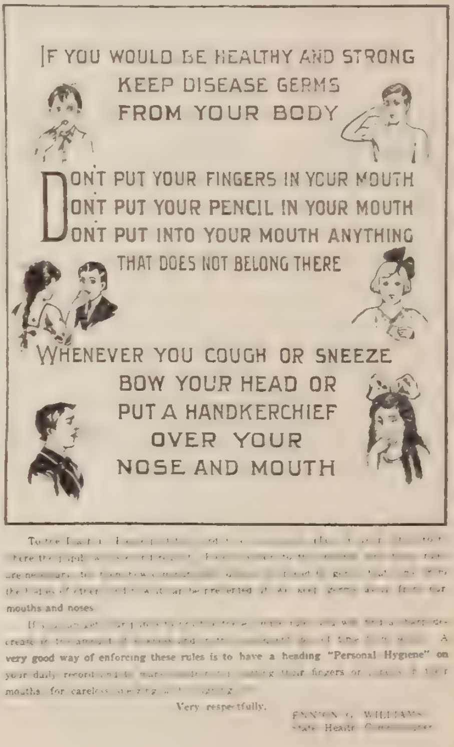
Vaccination properly done is not dangerous

Virginia State Board of Health

It then occurred to us that if tin could be substituted for pasteboard, more permanent results could be attained. Accordingly, the publicity agent of the board designed a series of six posters, covering the rudiments or farm sanitation and tuberculosis. Each of these was so lettered that the salient facts would stand out in large type, easily legible at thirty or forty feet. We had these lithographed and reproduced in black on thin sheet iron painted a lively orange color. Each placard is 9¾ by 13¾. The initial cost of the lithographed plates was $45 for the set of six and the cost per thousand thereafter was $22. As we have already used approximately 12,000 of these and still have the plates in excellent condition, the cost per placard has thus been only a little more than 2.6 cents. The work was well-done at these figures by the Richmond branch of the American Can Company.

As the placards are heavy, their distribution was something of a problem in itself. But we met this by having our hotel inspector, who travels in an automobile, placard the roads along which he passed and we shipped fresh supplies to him from place to place along his route so that he would not overload his car. A little later in the summer, we found two reliable medical students, who agreed to placard a large number of the main highways of the state for their traveling expenses and motor transportation. By giving them the use of a small touring car of popular make, we found the cost of distributing the signs very low. Through their efforts and those of the regular inspectors, together with the help of a few health officers in isolated districts, we have placarded most of the main roads of the Commonwealth and every one of the hundred county seats.

The results have been gratifying. Thanks to the material and workmanship, the placards



IF YOU WOULD BE HEALTHY AND STRONG
KEEP DISEASE GERMS
FROM YOUR BODY

DON'T PUT YOUR FINGERS IN YOUR MOUTH
DON'T PUT YOUR PENCIL IN YOUR MOUTH
DON'T PUT INTO YOUR MOUTH ANYTHING
THAT DOES NOT BELONG THERE

WHENEVER YOU COUGH OR SNEEZE
BOW YOUR HEAD OR
PUT A HANDKERCHIEF
OVER YOUR
NOSE AND MOUTH

To the [illegible] mouths and noses.

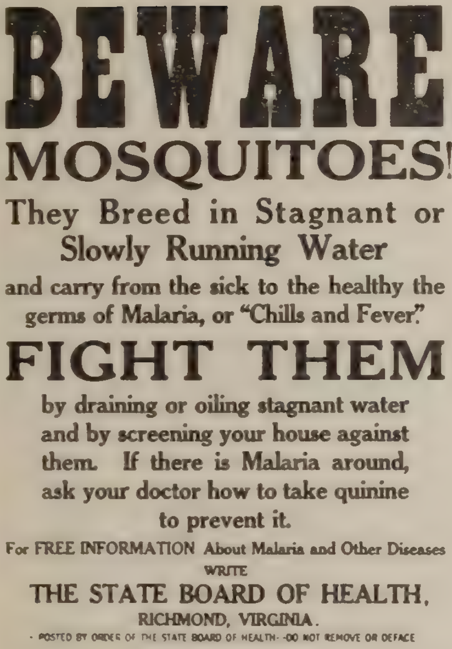
If [illegible] A very good way of enforcing these rules is to have a heading "Personal Hygiene" on your daily record [illegible] fingers or [illegible] mouths for careless [illegible]

Very respectfully,

ENNION G. WILLIAMS,
State Health Commissioner.

have remained unharmed in the vast majority of cases and have attracted much attention. One correspondent of the board went so far as to state in an unsolicited letter that he attributed the low morbidity from malaria in his district to the attention paid the warning of the placards by the people; and a legislator has offered to introduce a bill making it a misdemeanor for any person to tear down or deface one of the placards. Returning automobilists have often told us of seeing and reading the messages on the placards.

Taken as a whole, the experience of our board justifies us in calling this venture to the attention of other health authorities as another useful means to that constant publicity upon which the sanitary education of the people depends. To health authorities who wish to prepare such placards* as those we have been using, we shall be glad to send sample sets and to supply any information that may be possible.



BEWARE

MOSQUITOES!

They Breed in Stagnant or Slowly Running Water

and carry from the sick to the healthy the germs of Malaria, or "Chills and Fever."

FIGHT THEM

by draining or oiling stagnant water and by screening your house against them. If there is Malaria around, ask your doctor how to take quinine to prevent it.

For FREE INFORMATION About Malaria and Other Diseases

WRITE

THE STATE BOARD OF HEALTH,

RICHMOND, VIRGINIA.

· POSTED BY ORDER OF THE STATE BOARD OF HEALTH—DO NOT REMOVE OR DEFACE

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* Pasteboard placards for posting in schools cost $61.92 for 15,000.

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MARKET SANITATION.

The economic value of public markets is noticed by D. B. Armstrong, New York (*Journal American Medical Association*, January 13, 1917). He says it introduces into community life problems of sanitary and hygienic importance, which it has in common with the retail stores, but magnified by the concentration in a single area. The importance of inspection and public attention to these problems is evident, and he reviews the various methods which may be employed to meet them. These are the use of chemical and bacteriologic analyses in regard to the food stuffs sold and the municipal equipment should be so provided to meet these demands when plans for public markets are being developed. Cities will have to recognize in the future the necessity for standardization of food and calorific analyses will also be required. The importance of a living wage for the employees and their help can be met by periodic medical examinations, and a municipal laboratory equipment will have to be utilized. The city, if it maintains municipal markets, is under obligation of guaranteeing that food products shall be handled by individuals free from communicable disease. Suitable sanitary toilets and other facilities must be provided and food protected from animal contamination by at least a two-foot elevation from the floor. Receptacles with covers should be provided for rubbish and garbage, and arrangements made for their proper care. Adequate refrigeration is essential. The laws regarding spitting should be strictly enforced. Articles of food should be protected from flies and other contamination, and there should be efficient janitor service. Public markets under municipal control should take advantage of the use of placards, leaflets, etc., for the education of the public regarding the dangers of food infection by handling, coughing, etc. Adequate light and ventilation are essential. The floors should be waterproof and properly drained, and a plentiful water supply for flushing and other general purposes is absolutely necessary. The establishment of a market department or division in the municipal scheme is a valuable asset in meeting these requirements. The keynote of modern sanitation, especially food sanitation, is personal cleanliness in all who have to do with the functions of the market.

MICHIGAN'S PART IN THE WAR ON TUBERCULOSIS

ARNOLD MULDER,
Publicity Agent, Michigan Tuberculosis Survey, Holland, Mich.

THE states in which the governor and legislature look upon it as a legitimate function of government to combat the great preventable diseases are still so few that whenever a new one enters the lists to do battle, as a state, against the great destroyers, it is matter for rejoicing on the part of all who have the cause of public health at heart, wherever they may live. Whenever another state goes over to woman suffrage, suffrage leaders in states a thousand miles away congratulate themselves on the event, because they know that it means much more than the mere addition of a single state to their ranks; they know that the effect of each addition is cumulative and that when the wave shall have become strong enough it will carry everything before it. Similarly in the great public health movement in the United States, each new addition means more than what the face of things shows. Such entry of a state into ranks of commonwealths that are making public health one of the main functions of government is of interest not as an isolated phenomenon but as a part of a great social movement that future sociologists cannot help taking into serious account when describing the development of American civilization.

That is the reason why this brief account of the new state public health movement in Michigan may be of interest to the readers of this magazine. This state is at present in the thick of a tuberculosis survey which, public health leaders throughout the state believe, will help materially to hasten the day when the United States government will meet the menace of the white plague with something of the adequacy in which it is met in Germany for instance.

This is not by any means the beginning of the anti-tuberculosis movement in Michigan. As in practically all other states, the war on tuberculosis began with scattered skirmishes many years ago; and also as is the case in most states, it was for a long time largely private enterprise. All these scattered attempts to check the spread of the disease were finally focused in the State Anti-Tuberculosis Society, which has been doing excellent work for many years. The next step came when the 1915 legislature gave the fight against tuberculosis official recognition by appropriating $100,000 for a state wide tuberculosis survey, which work, under the direction of the State Board of Health, is now in full swing.

This bit of health legislation which has made it possible for Michigan to take a great stride forward was the result of a natural evolution through which most pieces of important legislation must pass. First there are the scattered individuals working for a cause; then whole communities become nuclei of influence and agitation; next there is organization and state wide team work; finally the lawmakers learn to understand the signs of the times and take the steps that are necessary to give the movement the stability and support that the backing of the powers of organized government alone can give.

When the legislature had passed the bill providing for this forward step and the governor had enthusiastically signed it, there was no plan of procedure suggested. The state merely provided the funds and told the State Board of Health to use the $100,000 as their best judgment should dictate, the only restriction being that the money was appropriated for the two-year period that marked the life of that legislature, $50,000 being appropriated for each year. Hence the present tuberculosis survey in Michigan will come to a close on May 31, 1917, two years after the date when the bill took effect. There were several ways open to the State Board of Health for making an effective campaign against tuberculosis, and most of the methods being followed elsewhere were given due attention. The system that was finally adopted contains nothing that is startlingly new, but the event is proving that it is well adapted to this state and that it is bringing real tangible results. The campaign in Michigan is of interest to anti-tuberculosis workers throughout the country if for no other reason than that it works. There is nothing so successful as success—and few things so interesting. As one woman expressed it in a county where a State Board of Health tuberculosis survey was being held, "It has become the popular thing to go to the free tuberculosis clinics; the one thing I can urge for your way of appealing to the people is that it works."

First of all an organization was formed by the State Board of Health which at present is composed of the following, referred to usually as the "Health First" party because of the fact that the words "Health First" form the slogan of the campaign: a director of the survey, Dr. William De Kleine; a public speaker; a housing survey expert; twelve visiting nurses; a clinician; a publicity agent; several part-time diagnosticians who are used as the circumstances demand.

This party of health workers began active operations on October 1, 1915. The county was chosen as the unit of attack, the plan being to visit each of the eighty-three counties in the state before the close of the two years' survey. Usually three weeks are spent in each county, but frequently when counties are small, two are "covered" at the same time. A description of a sample survey in a county will give a clear idea of how the fight against tuberculosis is carried on in Michigan:

During the first week of the three weeks' survey nurses go into the county to pave the way. First of all they visit the local doctors. They give the physicians a clear idea of the scope of the work, how long the campaign will last, what is expected to be accomplished, and so on. The coöperation of the local doctor is looked upon as indispensable to the sucess of the work. Not only does he know where prospective patients are to be found and which family is likely to be most benefited by a free examination of its members, but the permanent effect of the work done by the state "Health First" party is dependent largely on how the local doctors take hold and keep up the fight after the state workers have passed on to another county. The nurses therefore attempt to arouse the interest of every doctor they can reach. In each town of any size they make arrangements with them for a series of free public clinics to be held in some centrally located building, such as the city hall or the courthouse. They ask the physicians to prepare lists of patients who in their opinion would be benefited by an examination for tuberculosis. They make arrangements with the doctors to come to these clinics and to take an active part in them. They show them that it will be distinctly worth while for them to be present during the several days while a tuberculosis diagnostician examines people and while he shows, much in the same way in which a professor lectures to a class of medical students, why a particular verdict is reached in each case.

The nurses during that first week moreover visit anti-tuberculosis societies and civic health societies and women's clubs and school and church organizations. They make an attempt to secure the intelligent coöperation of all these organizations in the coming campaign. By the aid of the doctors they draw up lists of persons who are suspected of having the disease or who are known to have been exposed to an open case. They visit the homes of many such persons and attempt to interest them in the survey with a view of getting them to come to the free public examinations the second week of the survey.

Hand in hand with the work of the advance nurses during the first week of the survey goes the work of the publicity agent whose duty it is to get into touch with the various sources of publicity in each community. First of all he visits the newspaper offices in the various towns. He explains to the editors the scope and purpose of the county campaign and tries to interest them in the work. He tries in each case to make the editor see that, aside from the good that will be accomplished, the survey is in reality a big news feature for the local papers. His aim is not first of all to get the papers to print a lot of scientific facts about tuberculosis, but rather, through regular news articles about the survey, to help to arouse so much public interest that, in the words of the lady quoted above, "it will become the popular thing to go to the free clinics." To this end he prepares articles covering every phase of the work, all written from the local paper's point of view, as if the survey were being covered by the paper's own staff of reporters. In addition to this he furnishes each paper with a series of educational articles in which the fundamentals of the disease are described in newspaper style—the causes, cure and prevention of tuberculosis, as well as the scope of the disease, its bearing on society, its economic aspects, and so on.

In addition to that, the publicity agent gets into touch with the ministers of the community, with the manufacturers, with the mayors, school superintendents, chambers of commerce. Each minister is asked to announce the dates and places of the free clinics from his pulpit and to preach a sermon on tuberculosis. For such sermon a sermon outline is furnished which contains the fundamental facts about tuberculosis on which a Sunday discourse can be based by anyone who has not made a study of this particular subject. The manufacturers are requested to pick out such of their men as are physically run down and to let them visit the free clinics without cutting wages for time lost; moreover they are asked to do all they can to improve conditions under which the men must work. School superintendents are asked to have their teachers pick out such pupils as may need an examination and bring them to the public clinics. Mayors are requested to call a meeting of the council to which the public is invited and at which one of the party of health workers can give an address on public health needs of that particular community. Chambers of Commerce are asked to provide a similar opportunity for a public meeting. In towns where there are Rotary clubs or similar organizations, similar requests are made of them.

That about ends the work of the first week of the survey. The second week is known as free clinic week. Clinics are held during four or five days of the week in the principal towns of the county, the aim being to reach as nearly as possible every section. Usually three or four tuberculosis diagnosticians are at work at the same time in a county, because clinics are often held in three or four towns on the same day. From eight o'clock in the morning till five in the afternoon the clinicians examine the patients as they come to them in a steady stream. In each place where a free clinic is conducted three rooms are pressed into service—a waiting room, a dressing-room and a clinic room. The waiting room is presided over by nurses who take the temperatures of the patients, their personal and family histories of disease, etc. This record accompanies the patient into the clinic room. About the clinician, like a class of students in a college, are ranged the local doctors, and each one is given full opportunity to study each subject that comes before them.

Dr. William De Kleine, Director of the Division of Tuberculosis of the Michigan State Board of Health, and Miss Mary E. Marshall, Superintendent of Nurses, examining a patient in Michigan's state wide fight against tuberculosis.

At the end of the clinic week the records of all positive cases are sent to the Secretary of the State Board of Health to be placed on file in the office in the regular way, the state law requiring the reporting by physicians of all cases of tuberculosis they treat. Moreover, records of all "positive" and "suspicious" cases are kept on separate slips for local use. Each patient examined is requested to place himself under the care of his own family doctor. Each doctor is furnished with the list of cases from his own practice examined by the state clinician and is given the findings in each case. This ends the second week of the survey.

The third week is known as "educational week." During this week the addresses are delivered for which arrangements were made by the nurses and the publicity agent during the first week of the survey. Talks are given in schools, in colleges, before civic bodies, literary societies, women's clubs, church societies, etc. It is during this week also that the addresses are given before councils and boards of supervisors, chambers of commerce, Rotary clubs. At the sessions of the city and county governing bodies the necessity for action on the part of the local authorities is emphasized. The work done during the clinic week is reviewed and the lesson of the large number of cases that are invariably found is driven home. Attention is called to the necessary steps that must be taken to improve health conditions and to prevent the spread of the disease. Usually the need of one or more visiting nurses is urged upon the board of supervisors. The councils in the cities are told that they need a visiting nurse, a full time health officer, an adequately equipped laboratory, and both county and city authorities are told that each county should have a tuberculosis sanatorium.

In the talks in the schools, churches, before clubs and societies the fundamental facts in regard to sanitation and right living are usually emphasized. These talks are along broad lines and in them usually the building up of general health is advised as the best possible method of avoiding tuberculosis. The open window, wholesome food, rest, recreation, cleanliness, proper dress are most often featured.

During the final week of the survey, moreover, nurses go into the homes of the persons listed as "positive" and "suspicious" cases. They handle each case as to personal needs. The person afflicted with the disease is instructed as to how to take care of himself and what steps to take to get well. His family is instructed as to what they must do and what they must not do to guard themselves against infection. The nurses, in short, do all that can be done in a brief visit to make the victim of the disease and his family circle familiar with the needs of the situation and how to make an aggressive fight against tuberculosis.

This three weeks' survey in a county is followed by such judicious "follow-up work" as circumstances will allow or seem to demand. If as a result of the survey a county is for instance aroused to the necessity of erecting a tuberculosis sanatorium, the director does all he can to encourage such a movement. The publicity agent conducts a publicity campaign that has for its purpose the focusing of public opinion on this subject and perhaps nurses are sent to help the movement along by some more personal visits. Similarly when cities propose the erection of open air schools, or when counties seem to be ready for the appointment of county visiting nurses, or when a town gives signs of preparing to appoint a full time health officer, the state health commission gives all the encouragement and support it can give. Also along the line of "follow up work," the publicity agent keeps on supplying the newspapers with weekly stories about the disease and about the campaign against it.

"And does this plan of campaign work?" is a legitimate question. In view of what the State Board of Health is trying first of all to accomplish in the present survey, namely to locate the greatest possible number of cases of tuberculosis in the shortest possible time, the answer to this question will be found in the number of people who actually present themselves at the free clinics for a physical examination. If people are sufficiently aroused in any given community by the methods employed to take the time to have their physical condition looked into, then those methods stamp themselves as successful; if not, they might as well be abandoned, no matter how well they may look on paper.

As this is written, exactly one year has passed since the actual work of holding examinations was begun. During that time the "Health First" party has visited thirty-eight counties, and in those counties 11,528 persons have presented themselves for examination. Approximately 44 per cent. of this number have been diagnosed as victims of tuberculosis, very many of them in the earlier stages when cure is still easily possible. Often in a county, during a four days' series of free clinics, as many as six hundred or seven hundred persons present themselves for examination. At the present rate some 25,000 of the citizens of Michigan will have been examined for tuberculosis before the end of the two years' survey. Which figures speak for themselves in answer to the question, "Does it work?"

But a battle is not a war, and no one is more conscious of the fact that the present movement in Michigan is only a battle, than the State Board of Health and those who are actively engaged in the survey. When the survey was begun the State Board of Health had no illusions about wiping out tuberculosis in Michigan. An enemy that has been entrenched for thousands of years is not to be conquered in two years. But Michigan in this survey hopes to make some little headway and to do some work that will have permanent results. To this end each community is told as forcibly as possible through public address, through the newspapers and in various other ways, that it must not look upon the present survey as anything final but that rather it must use the present survey to aid it in building up the defenses against preventable disease—that it must try to do, as a permanent function of the local government, what the State Board of Health is doing in the brief visit of the "Health First" party. The people of a community are told that each county needs a well organized full time health department, consisting of a full time health officer, two or three visiting nurses, a bacteriologist, a veterinarian, sanitary inspectors; it is told that it needs a laboratory, well equipped, for use of the health department, a tuberculosis sanatorium, fresh air schools, physicians are asked to organize systems of holding weekly free tuberculosis clinics like the ones conducted by the State Board of Health during the brief survey.

And is the survey proving successful in getting results of this more permanent nature? That is not as fair a question as the one in regard to the number of people who attend the clinics, or at least it is not as capable of a definite answer. Anyone who has ever done social propaganda work knows that it takes a long time to arouse large masses of people and that tangible results sometimes do not come until years after efforts are put forth. Even when the present survey shall have been concluded it will obviously be too early to estimate what the permanent results will be. It is not at all impossible or unlikely that ten years from now some community may vote to build a sanatorium or adopt the full time health department plan or appoint a corps of visiting nurses as a result of forces set in motion in the community by the present survey.

But even as early as this these more permanent results are not entirely absent. In two cities of the state, one with a population of some 40,000 and one with a population of about 10,000, full time health departments have been organized as a result of the survey. In three or four cities fresh air schools have been established, and in several other places work is going forward for similar schools. In eighteen counties the erection of tuberculosis sanatoriums is being strongly agitated, and in at least one county the matter has gone far enough so that the project came up for a vote of the people and was carried

But the best permanent result which it is hoped the survey will have is to arouse in the mind of the people of the state a vivid consciousness that tuberculosis is not an isolated phenomenon but that it is closely tied up with most of the other great preventable diseases—to make people see that what is done to prevent tuberculosis is done to prevent many of the other great diseases, and what is done to prevent many of the other great diseases is done to prevent tuberculosis. It is estimated that from 8,000 to 10,000 persons die in Michigan each year as a result of preventable disease. And that Michigan is not alone in this is shown by the statement of another reliable statistician that there are in the United States each year 600,000 deaths as a result of disease that could be prevented. The present tuberculosis survey in Michigan aims, in addition to tracking down all the cases of tuberculosis that can be found, to give the public a poignant sense of the essential solidarity of the forces of disease and the urgent necessity of solidarity on the part of the forces of health in order to meet the combined menace of the great preventable maladies.

Hence Michigan, in these county tuberculosis surveys, does not specifically lay the greatest stress on the necessity of a community erecting a tuberculosis sanatorium (although that is strongly urged in each county), but rather on the necessity of each county and each city organizing an adequate full time health department. In these days of preparedness agitation it is comparatively simple to create in the mind of the public a concept of preparedness against disease that will be something more than mere generalization. And that is what the Michigan State Board of Health is aiming at—complete preparedness against disease in each community in the state, believing that such a system of preparedness will be the very best way of permanently coping with the tuberculosis problem.

Received for publication, September 1, 1916.

EDUCATIONAL WORK OF THE BROOKLYN ANTI-TUBERCULOSIS COMMITTEE

HESTER D. JENKINS, PH.D.,
Educational Supervisor, Committee for the Study and Prevention of Tuberculosis, Bureau of Charities, Brooklyn, New York.

A GREAT deal of work with children is done by the Committee for the Study and Prevention of Tuberculosis of the Brooklyn Bureau of Charities, for it is both important and promising. The children of the poor are generally more progressive and better educated than their parents, if for no other reason than that the public schools are far better than they were a generation ago. And when the children are born of immigrant parents, who came to this country with very little notion of health or hygiene, they must not only learn to live from people outside of their homes, but furthermore the homes need all the enlightment that the children can bring into them.

Educational work among children awakens immediate if only passing response. Their interest is so easily aroused that if one but remembers that they are children and not scientists, the real problem is not how to interest them but how to make the impression lasting and how to translate it into mental response and action.

The plan of campaign in schools is the following. When permission has been obtained to speak at a regular assembly, the supervisor chooses some one or two simple ideas bearing directly on the prevention of tuberculosis, such as the importance of cold water for drinking and bathing, or the need of fresh air, or the danger in spitting, coughing and sneezing, and talks from ten to twenty minutes on this theme, giving the physiological reason for the habit she is trying to inculcate, brightening the talk by illustration and anecdote, and always ending with careful details and practical advice. The spit, sneeze and cough campaign is prefaced by a careful account of the germ theory of tuberculosis, and followed by practical directions.

Often the children are questioned to see whether they have received the idea, and generally they are asked to promise that they will sleep with their windows open that night, or take a cold bath the next morning, or whatever the object of the talk might have been. The teachers are asked to inquire the next day how many have done this. In one school the pupils were given five minutes in which to talk among themselves about the lecture. In several schools the talk has been the subject of compositions, and I have been pleased and surprised to learn how intelligently the boys and girls will report of the talk. Another plan is for the principal to add to the talk of the expert comments of his own.

Then little hand-bills are given to the children to take home, and they are urged to tell their parents what they have learned. We have cards or hand-bills on Fresh Air, Cold Water, Don't Spit and Swat the Fly, and attractive posters on Fresh Air and Cold Water.

In getting out one of our most successful posters, we attempted not only to be instructive but also to inspire through a picture a real desire for fresh air. This we did by selecting a beautifully colored picture called, "On a Pinacle," painted by Mr. Curran, and reproducing this in colors by his kind permission. The picture alone irrespective of the letter press makes one draw a long breath and feel the joy of fresh air. It has been a distinct health agency and requests have been received for it from all over the country.

We have slides to illustrate the talks on occasion, and we use the moving picture stories of tuberculosis in the motion theatres and occasionally in Christian Associations or settlements. This always attracts the children, but

I am not sure that it teaches them so much as the talks do; it is however, valuable as deepening the impression already made.

A year ago we got out a miniature exhibit especially for children. We had used the regular exhibit of the National Association for the Study and Prevention of Tuberculosis, but felt that one directly adapted to children, and incidentally to our Brooklyn work would have many advantages over the other. The plan was to have the ideas as few and simple as possible and to group all the subordinate matter around it. Then we made our exhibit pretty, having a buff background and a sepia frame and the pictures attractive and in a few cases colored. The upper half of the screen was headed with these words

THE BROOKLYN COMMITTEE
on the
PREVENTION OF TUBERCULOSIS
SAVES CHILDREN
from Death and Tuberculosis.

and under it are large photographs of the Medford Sanatarium, the Day Camp Rutherford, a fresh air class for anemic children in a public school, a school lunch, and a visit from a district nurse. This half of the screen also contains a few central facts about tuberculosis.

The lower half of the screen was headed

WHAT YOU CHILDREN CAN DO
TO PROTECT YOURSELVES
FROM CONSUMPTION,

and contained small sections sometimes with pictures and sometimes with advice only, such as, Keep Clean, Keep Well, Love Fresh Air, Go to Bed Early, Learn to Choose Nourishing Food, Keep out of Doors, ecetera. This advice was either illustrated in picture or amplified in print.

This exhibit has been placed in schools, churches, empty stores and other prominent places. When it is placed in a school, it is usually after the supervisor has given a health talk, so that it is one of the ways of driving in the impression made by an address.

Still another educational effort in the schools was made through the Brooklyn Bureau of Safety which is connected with the Brooklyn Rapid Transit Company. They have been placing on the bulletin boards of many of the public schools weekly "safety" bulletins. Persuading them that health was a branch of safety, we obtained from them permission to write six of the weekly bulletins on subjects connected with tuberculosis and fitted to the especial season in which they appeared. For instance, a Thanksgiving bulletin expressed thanks for the health intelligence that teachers and others now give the children, and gave some fundamental facts about tuberculosis; a January bulletin made a New Year's Resolution not to spread tuberculosis by carelessly sneezing, coughing or spitting; and a spring bulletin called for warfare against the fly.

A recent development in our department has been the short playlet, to be acted by the children themselves. This idea was not original with us, but the Brooklyn Committee was the first to publish a volume of such playlets and the first to put them into general use.

When I was running a fresh air campaign most vigorously in Brooklyn with literature, posters, talks and newspaper publicity, I wrote our first playlet called "Judith and Ariel." The theme was the sick girl Judith who was tortured by Headache, Cold and Weariness until the Nurse and the Boy Scout opened the window letting in Ariel with her train.

This playlet was received with so much eagerness by several settlements where children presented it, that others were written, one on "Our Friends the Foods," one on health in general, called "Mother Goose Up-to-Date" and a fourth called "In a Tenement." Later "Baby's Godmothers" was written for Baby Week.

These playlets may be acted in ten or fifteen minutes, and require no scenery; the costumes may be as simple or as elaborate as desired. They have been presented in the regular assembly hour in many of the Brooklyn and Manhattan Schools. Several of them combined with some music and perhaps a talk with or without slides makes a good entertainment for a church or settlement, and interests the parents as well as the children. These playlets have sold all over the country until now there is scarcely a state in the Union that has not sent for copies of them. I think they convey the idea clearly, too obviously for a literary adult, but not too plainly for children. Our latest playlet, "In the Forest of Arden," is intended for somewhat older boys and girls, and is more general in its teaching.

In addition to its general educational work, the Anti-Tuberculosis Committee gives special and intensive education to the children whom it has directly under its care. These children are the twenty-five in the sanatorium at Medford, Long Island, who are in the early stages of tuberculosis, the fifty or more in the Day Camp Rutherford, and the anemic children in the fresh air classes of the public schools, which were originally organized in Brooklyn by the committee, who still maintain a supervisor and furnishes milk and crackers.

At Medford, the children are taught hygiene and useful work and attend a little branch of the public schools. In the fresh air classes, in addition to their regular courses, the children have special exercises and training in breathing, and are taught healthful living.

The Day Camp does the most in this line. There are two regular classes forming an annex to P. S. No. 17, and in addition the children have classes in cobbling and sewing to fit them to help themselves at home, and a special instructor in corrective gymnastics and breathing exercises. The superintendent has ardent ideals of teaching the children how to keep well and how to live cleanly and comfortably. Her work is further impressed by a social service nurse who has recently been attached to the camp to follow up cases in the home and deepen the educational work done by the institution.

Received for publication, October 19, 1916.

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A FAR REACHING FACTOR.

You may think you can fence off some one phase of factory management and treat it as an independent problem but it won't stay within the enclosure you have built for it.

Take the safety-first movement. Its influence for good factory management is far-reaching. For instance, in these days of labor shortage the manufacturer who has developed a "safe and sane" sandblast method is glad of it for he finds it easier to get men for this ever-detested job.

That's only one way in which safety as a problem leaps its boundary of safe-guards and accident prevention education. Here's another. A recent item in the *National Underwriter* reads like this:

"Fire insurance companies, to a great extent, are now watching the credit of concerns in states where there are workmen's compensation acts, and especially where these are drastic. Fire companies, in passing on a risk, want to know whether the assured carries workmen's compensation insurance, as it is an important element in credit when it comes to writing fire insurance. Where a concern does not carry compensation insurance, it is liable to have a heavy loss and thus a moral hazard may be introduced. One of the companies speaks as follows: 'In our credit statement forms, as well as credit investigations, cognizance of this matter must be taken, and also credit grantors should be prepared to inform their customers on the main points of the compensation laws bearing upon their business.' "

Few management problems will stay "fenced in."—*Factory*, February.

DESIGNS FOR PRIVIES.

Richard Messer,
Richmond, Va.

Read before the Public Health Administration and Sanitary Engineering Sections, American Public Health Association, Rochester, N. Y., September 7, 1915.

THE proper disposal of human excreta in rural communities is still one of the most serious problems with which a state or municipal health department has to deal, a large percentage of the population being dependent on privies of one kind or another. Although the privy problem is important the world over, it is of special interest in our southern states in which the fly season is longer and in which are extensive areas of hookworm infection. The relation between summer typhoid and improper disposal of excreta is too well known to need further discussion. Concerning hookworm, the efforts of the International Health Commission are being directed almost exclusively towards educating the rural people to the need of sanitary conveniences in order to prevent the spreading of human filth.

During the past twenty years or more, sanitarians have been trying to devise a simple, practical and at the same time inexpensive type of privy. Various types have been suggested and adopted from time to time, but experience has shown that each has certain disadvantages. Opinions as to the relative merits of the type best adaptable to general use vary. For instance, it is found that one state department of health may advise against the type of privy recommended in the adjoining state with similar geological, climatic and rural conditions. That the problem needs further study is clearly evident, for upon its satisfactory solution depends the eradication of fly-borne typhoid fever and hookworm infection.

To bring about further discussion, the writer has endeavored to incorporate in this brief paper a description of all known types of so-called sanitary privies with remarks as to the advantages and disadvantages of each.

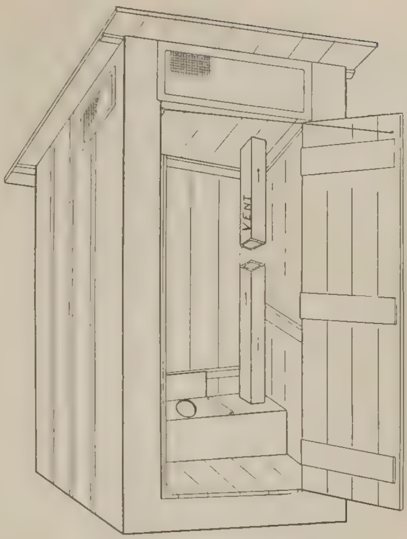
The sanitary privy is, first of all, the best substitute for a modern water-closet connected with a sewer. Whatever the type, it must comprise some kind of water-proof receptacle for the stools and urine and some kind of house or room in which the calls of nature may be responded to with privacy and convenience. The principal object is to prevent the spread of disease by the dissemination of germs contained in human filth either by the contamination of a drinking water supply or by its transmission to foods through the agency of flies, insects or animals. In addition, the contents must be capable of removal with as little trouble as possible, objectionable odors must be reduced to a minimum by proper ventilation and, finally, the cost of the entire structure must be as low as practicable. In general, all types come under two main classes—

the so-called "dry system" and the so-called "wet system." For convenience they may be listed as follows:

1. Dry System:
    - (a) Vault type, water-tight.
    - (b) Pit type, non-water-tight.
    - (c) Removable receptacle type, water-tight.
2. Wet System:
    - (a) Liquefying tank type.
    - (b) Chemical closet.

Privy House.

The general features of the construction of the privy house proper are to all practical purposes the same for all types of privy. It is designed to accomplish three objects: (1) To guard the receptacle against flies; (2) to give protection against weather; and (3) to reduce nuisances to a minimum by means of proper ventilation. This last is of special importance in warm climates. A substantially built, plain and simple structure is all that is required, one that can be built by any practical man with the least expenditure for materials. Simplicity in design and economy in construction are two very important points in connection with a type recommended for general use. In the diagram is shown a view of a suitable house, which in general outline and finish is practically the same as shown in the bulletin issued by the United States Public Health Service. It has the usual self-closing seat, the screened ventilator opening near the top, the water-tight, overhanging roof and is made as nearly fly-proof as possible by a self-closing door and laths over the joints. Special attention is called to the shaft ventilator extending from the seat up through the roof, which is a decided improvement over the screened openings at the sides shown in most designs which have appeared in public health bulletins for a number of years. Objections to the use of screened openings are (1) failure to provide adequate ventilation, (2) receptacle chamber is not kept dark, (3) the screens soon rust out or are kicked out. The shaft may be built of lumber or may consist of pipe.



FRONT VIEW

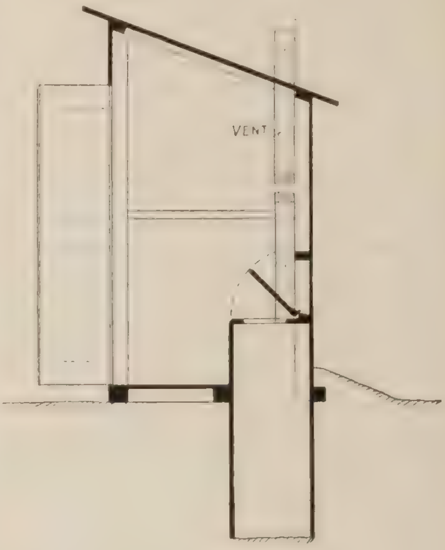
PRIVY HOUSE

Vault Type.

This is one of the older styles of privy, but is still used in many places, especially in northern cities. It consists of the usual privy house with a masonry, brick or concrete vault under the seat. Vaults vary in shape and dimensions, but as a rule are comparatively shallow but large enough to hold several months' accumulation. In cleaning, the contents are removed with a shovel through an opening in the rear. Flies and animals are excluded by a hinged door or suitable cover. Dry, pulverized earth, ashes or air-slaked lime is generally used as a deodorizer, from which comes the name "earth closet." In liberal quantities, earth renders the night soil much less offensive, especially during removal, and to some extent it keeps away flies. A serious disadvantage is due to the possibility of flies breeding in the semi-moist material. Another danger is from the possible development of hookworm embryos in the vault and later infection of the soil with the contents as the material being inoffensive may not be buried deep enough to prevent hookworms in the infective stage from reaching the ground surface. In warm climates, the use of earth with this style of privy is absolutely imperative.

Pit Privy.

This style of privy is a radical departure from the water-tight receptacle privy. Experience in poor rural districts has shown the necessity of reducing the cost of construction and maintenance to a minimum before any material progress can be made. The pit privy consists of a substantial house set over an excavation or hole in the ground. As soon as this hole gets about two-thirds full, the house is removed to a new pit and the first is carefully covered with earth. The pit is usually dug to a depth of three or four feet, sometimes deeper, and lined with boards to prevent the caving in of the sides. After the house is set in place, earth is banked around the rear and sides to keep out flies and surface water. Since it is specially important that the pit be kept dark, ventilation is provided by a pipe or shaft.



PIT PRIVY

Since there is danger from seepage reaching a ground water supply, there are certain limitations which govern the location of the pit, namely: it must be placed a safe distance from a well or spring and on ground which is lower and it must not be located directly over a limestone formation. As to a safe distance, this depends altogether on the kind of soil or rock formation. For instance, natural filtration through a sandy soil would render the seepage harmless in a comparatively short distance while in a loose rock or coarse gravel stratum, the pollution might travel several hundred feet. It is specially dangerous where there are any faults or crevices, which are often present, and passageways left by rotten tree roots.

These remarks apply particularly to dug wells as properly cased, deep drilled wells are not usually subject to contamination from the ground surface. Therefore, there may be a difference of opinion whether a minimum distance of 100, 200 or more feet should be specified. It would seem best that every individual case be passed on by a responsible health officer. It is the opinion of the writer that pit privies are very undesirable in communities where people depend on shallow wells; in fact, a well with several of these privies within a radius of 100 to 200 feet would be viewed with suspicion.

In limestone regions, it is impossible to tell how far pollution may reach. From a sanitary standpoint, it would seem a better policy to destroy disease germs on the premises rather than turn them loose with the possibility of their reaching a spring several miles away. The breeding of flies in the pit is also an objection which has been brought against this type of privy. Although the writer has not investigated this matter, it would seem that the moist material would offer an ideal breeding place.

Will the privy be moved at the proper time or will the owner wait until the contents become so offensive that he will be forced to secure a new site. The writer is inclined to believe that the latter will be the case in most instances unless, perhaps, there is regular inspection by a health officer. Probable failure to carry out this recommendation would seem an objection to recommending the general adoption of the pit privy.

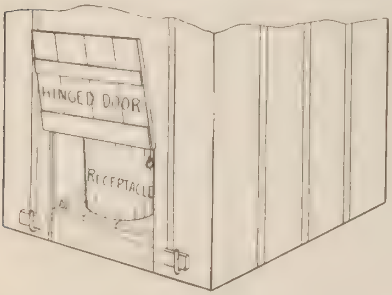
In mining camps and mill communities, having foreign populations, the pit privy is often the best type to recommend on account of its low first cost and ease of maintenance, provided, however, that a safe water supply is furnished by the company, through a pipe system, as is usually the case.

REMOVABLE RECEPTACLE TYPE.

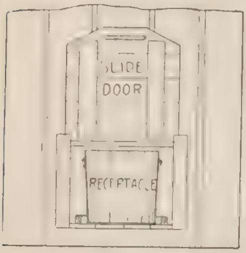
This consists of a substantial privy house with a fly-proof compartment underneath the seat in which is placed a water-tight receptacle, either a wooden box, barrel, galvanized can or some sort of tub which must be accessible for removal and cleaning. This type is the one most frequently described during the past ten years under the name of "dry closet," "dry earth closet" and "Stiles closet," the latter having a pail or bucket receptacle, and is specified in the health ordinances of many towns and cities of the South.

A galvanized can, about sixteen inches in diameter and sixteen inches high, fitting close up underneath the seat, is the best kind of receptacle although a wooden bucket, tub or lard pail is almost as good. Any of these should be provided with handles and be held in place by guide pieces nailed to the floor. Too often no mention is made of the latter in the specifications. Wooden boxes are unsatisfactory for they soon become leaky due to warping, are too heavy to handle and hold excreta long enough to permit the breeding of flies.

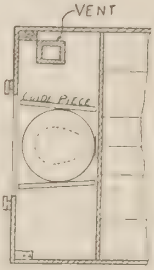
To keep flies away from the receptacle is a difficult matter. The hinged door at the rear, being exposed to weather, soon warps, leaving openings around the edges, the self-closing seat cover fails to operate properly due to rusty hinges and the front door is seldom kept closed. The objection to screened ventilator openings, described in the bulletins of the United States Public Health Service, has already been mentioned.



PAIL PRIVY



REAR VIEW



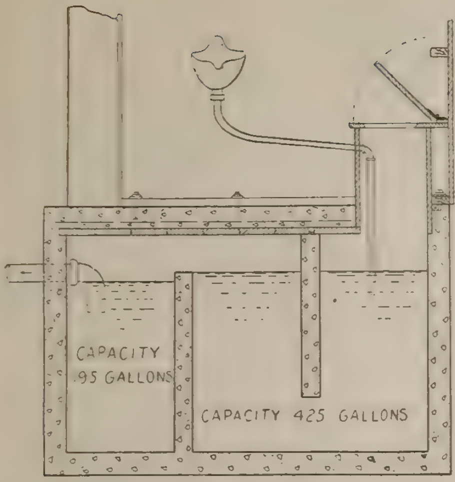
PLAN

The can or bucket receptacle requires frequent and regular cleaning—in summer at least once each week and about every two or three weeks in winter. The lack of proper attention in regard to cleaning is perhaps the principal drawback to this style of privy and one which makes it practically a failure for general use. In towns it is becoming more and more difficult to find anyone willing to do this kind of work and in rural districts the privy is usually neglected. Objectionable odors during warm weather is a complaint often heard although these can be reduced somewhat by the use of dry earth and the shaft ventilator. That the pail system has not proved entirely satisfactory for the average rural conditions is generally admitted, although there are a number of sanitarians who believe that a better method has not been found.

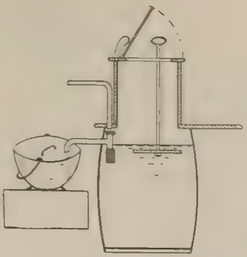
Liquefying Tank Type.

The L. R. S. Privy, based on the experimental work by Lumsden, Roberts and Stiles in 1910, marks the beginning of the wet method of disposal. The details of the method of operation are too well known to need description. Since then, various modifications, of which the Kentucky Privy is a notable example, comprising concrete tanks instead of barrels, have been adopted.

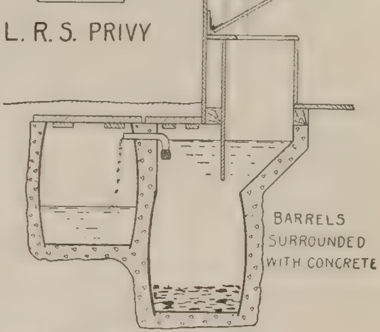
The principle of operation by which the feces and paper are liquefied in the receiving tank is practically the same for all. The advantages claimed for this closet are briefly as follows: (1) the breeding of flies in the tanks eliminated; (2) liquid effluent less objectionable and easier to handle than night soil; (3) cost of cleaning less because effluent tank may be built to hold two or three months' accumulation, and (4) odors are reduced to a minimum. Experience so far has shown that the above are borne out in practice. On



KENTUCKY PRIVY



L. R. S. PRIVY



MODIFIED L.R.S. PRIVY

the other hand, there is the disadvantage of the high first cost of installation, especially for concrete tanks. For this reason it has seemed a hopeless undertaking to bring about the general adoption of this style of privy in rural communities.

The so-called "anti-splasher" shown in the L. R. S. design is not needed when the water level is two feet or more below the seat. Concerning disinfection of the effluent, chemicals should be used. Boiling, of course, is absolutely impracticable. One can well imagine the farmer going to the trouble of boiling a kettle full of liquefied excreta so as to prevent the pollution of the soil in his garden. Such a recommendation will tend to cast discredit on a really good type of privy.

The Kentucky Privy differs from the L. R. S. in that the tanks are made much larger and the final effluent is disposed of by means of subsoil piping. The capacity of the liquefying tank is about 425 gallons and of the effluent tank about 195 gallons. With this long period of storage, it is thought that typhoid and similar organisms will die before reaching the outlet. That the privy is sanitary there can be no question, but, for general use, the expense of building seems prohibitive.

The Chemical Closet.

This type is different from all the others in that it may be located inside the dwelling. It consists of a cabinet with a self-closing seat, inside of which is a galvanized or metal receptacle. Odors are carried away through a vent connected with the chimney or a special stack and the contents are disinfected with some kind of coal tar liquid preparation. The various types advertised by the several commercial companies are all patented. There is no question that the chemical closet meets sanitary requirements, but most of the styles offered are too expensive. The idea of having excreta stored inside the dwelling for a month or two is also distasteful to a great many people.

COSTS.

It is impossible to give any accurate figures relating to costs of privies as conditions and price of materials vary for different localities. However, for the purpose of comparison, the following approximate estimates are given, based on average prices for labor and materials:

TABLE SHOWING ESTIMATED COSTS OF VARIOUS TYPES OF ONE-SEATED PRIVIES.

(Cost of house in each case assumed at $12.50 and separate from cost of materials and labor for the receptacle, vault, tank, etc.)

Type	Receptacle, vault, tank, etc.		House.	Structure complete.
	Materials	Labor.		
Vault.......	$3.00	$2.50	$12.50	$18.00
Pit..........	0.50	1.50	12.50	14.50
Receptacle...	1.00	1.50	12.50	15.00
L. R. S......	3.00	2.00	12.50	17.50
*Z..........	6.00	5.50	12.50	24.00
Kentucky....	20.00	12.00	12.50	44.50
Chemical....	..	...	....	$22.00 to $40.00

*Suggested design for L. R. S. privy with barrels enclosed in concrete.

CONCLUSIONS.

Which type of privy is the best to recommend for a community depends a great deal on the local conditions and, in particular, on how much money the people can be persuaded to spend for sanitary improvements. This question of first cost is the principal difficulty and cannot be eliminated, hence the necessity of sometimes recommending a cheap privy, the pit privy for example, as a compromise. From a sanitary viewpoint, the writer believes that some modification of the L. R. S. wet closet is the most satisfactory that has yet been suggested and, furthermore, the additional expense of building is more than offset by permanency and small cost of maintenance. That the problem is far from being satisfactorily solved is clearly evident.

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HUNTERIAN LABORATORY OPENED.

The Hunterian Laboratory of Johns Hopkins Medical School, the dream of the foremost physicians and surgeons of Johns Hopkins Hospital years ago, has been completed and is now formally opened. The building cost about $115,000. Its erection was made possible through the munificence of the Rockefeller Foundation. The scientific equipment alone cost many thousands of dollars. The purpose of the laboratory is to facilitate the work of the men engaged in the highest form of research work. Tunnels connect the laboratory with the medical school and the physiologic building. On the first floor are the medical library and the department of art as applied to medicine. Work at the laboratory is directed by a committee of professors and instructors of the medical school. Dr. Milton C. Winternitz is chairman of the committee, and has a laboratory on the fourth floor. The second floor has been leased to the Carnegie Embryological Institute. The third floor will be devoted to work in clinical medicine and children's diseases. The pathologic department will be located on the fourth floor.—*Exchange.*

Book Reviews.

Water Supply. *By William P. Mason. Fourth Edition. New York: John Wiley and Sons. X+528 pp. 6/9. $3.75 net (16s/–).*

The fourth edition of Professor Mason's well-known book on Water Supply testifies to the high esteem in which this book is held by the American engineering public. Published originally in 1896 it has passed through subsequent editions each time being substantially enlarged and improved. For the present edition a large amount of the text has been entirely rewritten and a suitable amount of new material added. The tables have been brought up to date and new photographs introduced. Some of the most noticeable changes are the following:

The chapter on Drinking Water and Disease has been strengthened by the addition of many pages devoted to typhoid fever. The work of recent years is drawn upon to set forth present day conceptions in regard to the existence of the typhoid bacillus outside its human host and in "carriers." The distribution of the disease and factors operating in its transmission are also discussed. Considerable material has been withdrawn from this edition relative to the now discredited theory of water-borne malaria.

Newly developed methods of water purification, particularly processes aiming at disinfection, come in for consideration, as do certain newly found factors influencing natural purification in streams and stored waters. The use of chlorine, ozone, ultraviolet light and copper sulphate receive attention. There is considerable discussion of various phases of the pollution of drinking water supplies and the care of watersheds.

Revisions and additions appear frequently throughout the chapters dealing with ground water and with the corrosive action of water. The appendices deal with entirely new subjects and are brief.

Professor Mason is always a pleasing writer and has the art of abstracting the important data from the writings of others and presenting them in an attractive form. Although this cannot be called an exhaustive treatment of the subject it is one of the most interesting and suggestive treatises on water supplies published since the old book of the same title by Professor William Ripley Nichols of the Massachusetts Institute of Technology.

George C. Whipple.

Fight for Food. *By Leon A. Congdon, M. S. J. B. Lippincott Co., Philadelphia and London, 1916. Price, $1.25 net.*

This book deals in a popular manner with various problems concerning food, food laws, and food adulteration. The author is in charge of the food and drug work of the Kansas State Board of Health, and was formerly employed as chemist by the states of New Jersey and North Dakota. He is, therefore, in a position to speak authoritatively upon this subject.

The chapter upon "The Enforcement of the Food and Drugs Act" is well worth the price of the book. The author has carefully looked up the status of food inspection in each state, and also by the Federal Government. These laws are enforced by Boards of Agriculture, by Agricultural Experiment Stations, by State Boards of Health, and by more or less independent State Food Commissions, as well as by the United States Department of Agriculture. The terms "Adulteration" and "Misbranding" are carefully defined and examples of adulteration and misbranding are stated. The question of color and bleaching is taken up, the author being of the opinion that eventually this form of treatment will cease, as such treatment is not necessary and is done only to improve the appearance of the articles.

The influence of food and drugs upon health is taken up, particularly upon the sanitary condition under which they are made and handled. In a similar manner the sanitary handling of milk is treated, and the sanitary handling of foods in the home.

The chapter on Rural Sanitation treats of the advantages of living in the country, but also speaks of the disadvantages, through unsanitary conditions, and recommends methods for improving these conditions by proper sewage disposal, carefulness in the dairy, and other precautions of a general nature, which, if carried out, will prevent the transmission of such diseases as trichinosis, tapeworm, malaria, tetanus, dysentery, typhoid fever, and tuberculosis.

The chapters on Food Economy, the High Cost of Living, and Remedies, are largely of an economic interest. The author is of the opinion that the country is in need of "Regulation of Trusts" laws. He states that "large cold storage plants are wonderful and truly economical institutions; but not for the public consumer if the so-called alleged 'interests' use them to advance prices on food necessities which are held until the market price can be inflated."

The book contains an interesting chapter on Flavor and Grading Food Products. The author is of the opinion, however, that some grades of food products need revision. The book closes with a chapter on Added Poisons and Drugs in Our Food. In this chapter the author speaks of such substances as alum, copper, nitrous acid, chlorine, saccharin, benzoic acid, sulphites, tartaric acid, and boric acid. The author is of the opinion that these chemicals which may normally occur in foods were not placed there by the Creator for the purpose of being extracted and added to other food stuffs.

Hermann C. Lythgoe.

Health Department Reports and Notes.

REPORTS.

Wilmington and New Hanover County, North Carolina.

To have a definite goal for your year's work, and as the year comes to a close to realize that the results of your work have equalled your greatest hopes, must be the experience of Mr. Charles T. Nesbitt, health officer of this territory, as described in the report of the splendid results accomplished by this health department for the year 1916. "From the North East River to Federal Point, and from the Cape Fear to the Sea—City, Suburb, Village and Farm—we are one people, striving for healthful and useful living." Such is the goal, and the remarkable advance in improved sanitation, since 1911 when active public health work was inaugurated, to the present day, is ample evidence that such a motto is not in vain.

In the city of Wilmington, about which this district centers, the 1916 total death-rate per 1,000 population, residents only, was 13.6, of which the white rate was 9.7 and the black, 18.3. Think of a colored death-rate in a southern city of population of 32,473, over 40 per cent. of which is black, of 18.3. The low general death-rate of 13.6 is even more commendable when we consider that the 1915 death-rates of the cities of Richmond, Va., and Savannah, Ga., were 18.89 and 19.39 respectively. The death-rate for the whole county was 14.2, giving a general rural death-rate of 17.1, which is highly commendable, since it is acknowledged that rural work is much slower than that of the city. The following tables shows well the steady and well sustained decrease in deaths since 1911.

Year.	*White.*	*Black.*	*Total.*
1911........	19.94	34.78	29.43
1912........	14.99	28.55	21.46
1913........	13.30	24.94	19.
1914........	12.27	25.80	18.62
1915........	11.1	22.8	16.4
1916........	9.7	18.3	13.6

Death-rates of infants under five years in Wilmington were 409.9 per 100,000 of the whole population, a reduction of 246 per 100,000 since 1912. A further interesting table, highly descriptive of the effectiveness of this health campaign, is that which shows the percentage of the total number of deaths which are preventable through public health work, including pneumonia and pellagra. From this table it is seen that in 1911, 54.16 per cent. of deaths were due to this class of causes; in 1916, 30.47 per cent. Typhoid fever shows an extensive, though somewhat erratic decrease since the rate of 100 per 100,000 in 1911; the 1916 death-rate being 12.3. The death-rate from enterico-colitis in Wilmington has been steadily cut down from 411.6 in 1911 to 73.8 in 1916, the greatest decrease being for 1915, when the rate was cut down from 220 to 80.

The reported death-rate from malaria, which in 1911 and 1912 caused a death-rate of 43 per 100,000, was 3.08 for the city, and 5.2 for the county as a whole. Pneumonia gave a death-rate of 138.5, which, with the exception of 1915, shows a marked reduction since 1911. Tuberculosis, which is the largest problem confronting this department, gave a city death-rate of 129.3 per 100,000, of which the white rate was 56.4, and the black, 217.17. The rate of the entire county was 153.5, a white rate of 62.5, and a black rate of 260.2. The death-rate in Wilmington in 1911 was 244.67. Smallpox has not appeared in this district since 1914, though the disease is still somewhat prevalent in surrounding territory. No deaths have occurred during the year from diphtheria, scarlet fever, measles, whooping-cough, and infantile paralysis. As an indication to the improvement in sanitary conditions, other than the extensive decrease in mortality, is the fact that the third inspection made by the U. S. Public Health Service for the purpose of grading the rural sanitation of Cape Fear township, made this last December, showed an increase of 33 per cent. in their rural sanitary index of 1915.

School and infant-welfare nurses have accomplished excellent results, both in the city and rural communities. Furthermore a volunteer medical inspection service was begun at the beginning of the present school session, which, though still in its infancy, promises success.

The approval and support of the people in this enterprise is well demonstrated by the fact that the public is continually increasing its demands, which the department is using every effort to meet, though the present force and appropriation seem to make this increasingly difficult. There can be no better proof of the efficacy and desirability of the continuance of this excellent health service than this report, brief though it is, and it is sincerely to be hoped that this progressive movement will not be fettered by false economy, resulting in either decreased appropriation or decrease in staff, particularly since the present facilities seem hardly sufficient.

Much county health work in the past has been little else but the name. Yet here we have a most instructive example of what can be accomplished in a county, and ample proof of the value of the full-time county health officer. That such improved records also occur among a population largely colored, give proof to the fact that modern health methods applied to the colored race will improve their health considerably. The report as a whole, though without many of the details characteristic of the larger city reports, is presented in a way that can not fail to show the public the extent of the improvement of their own health, and consequently should stimulate greater interest in the activity and further improvement of their health department.

Washington, D. C.

The recent report of the health officer of the District of Columbia, Dr. William C. Woodward, not only represents the record for public health during 1915, but also for the first six months of 1916.

Previous to 1915 there had been a constant dimunition in the death-rate since 1896, but from some unknown causes this continued decrease was not sustained during the year recorded, in fact the rate was considerably increased. In 1915 deaths numbered 6,505 as against 5,866 in 1914, with the corresponding death-rates of 18.18 and 16.59 per 1,000 population. This rate was based on the census of November 1, 1915, which showed a population of 357,749, strangely enough, an increase of only 3,787 since April 28, 1913.

Careful inquiry failed to show any cause for such an increase. The colored and white death-rates increased in nearly the same proportion, the former from 24.31 to 26.18, the latter from 13.64 to 15.13. The colored population is about two sevenths of the total population. The increase, further, was not limited to any age-group. Death-rate in the first year of life increased from 100 to 110 per 1,000 reported births. The most conspicuous feature of the year's extraordinary record is the increase in reported deaths from the so-called diseases of middle and advanced life. Deaths from diseases of the heart increased from 757 to 853; from chronic inflammation of the kidneys, 51 to 77; from apoplexy, 419 to 457; from arteriosclerosis, 143 to 154. Among the acute diseases, pneumonia showed the most conspicuous increase, from 468 deaths in 1914 to 671 in 1915. Deaths in tuberculosis increased from 611 to 698. Deaths from communicable diseases did not vary greatly from the preceding year. There was also an increase in deaths from external causes. It is obvious that such a general increase as recorded, particularly in view of the fact that in no other city, so far as has been observed, has there been any similar increase in the death-rate, must be due to some discrepancy in either the vital statistical records or in the census, and the very slight population increment between the dates recorded seem to point to the fact that it is there the error must be. Doctor Woodward, commenting on this fact, states that:

"In a search for the cause of this considerable, widely distributed, and unexplained increase in the death-rate, the census sheets delivered to this department by the major and superintendent of police were carefully examined, in the belief that it might be found that the increase was apparent rather than real, and due merely to some error in the determination of the total population. Some foundation for this belief existed in the extremely small reported increase in the population, one half of 1 per cent., which hardly seemed consistent with the apparent growth of the District. These census sheets, in so far as the office work of them was concerned,were, however, found correct. The total population, the age, race, and sex distribution, and distribution by localities, were found to be consistent with previous censuses. Moreover, there was no increase in the birth-rate and still-birth-rate, such as might naturally be expected to appear had there been any considerable increase in the population, not shown by the census returns. Infant mortality, computed upon the basis of recorded births and not upon the basis of the enumerated population, showed an increase in keeping with the increase in the infant mortality rate if computed upon the enumerated population. The health department has been unable, therefore, to find any facts upon which to base an explanation of this increased mortality rate. But in view of its wide distribution throughout the entire range of causes of death and among both races and all age-periods, it seems probable that the increase was apparent rather than real, and that it is based upon some discrepancy between the methods of enumerating the population in 1913 and in 1915, possibly upon the fact that in the former year the enumeration was made about the 1st of May, while in the latter the enumeration was about the 1st of November."

In a review of the vital statistics, January to June, 1916, it is to be noted that the apparently high death-rate that prevailed during the calendar year 1915 has continued through the first half of 1916. In the former period there occurred 3,398 deaths as compared with 3,388 deaths of the latter period. During this period, too, there was a further increase in the death-rate of the white population, though a decided dimunition in the colored rate was recorded. Furthermore, as during 1915, the high general death-rate prevailing was due to a wide range of diseases and not to any few.

The Bureau of Food Inspection during the reported period has been most active, especially in the condemnation of perishable foodstuffs, maintaining sanitary conditions in such places where food is dispensed, and in the proper regulating of the use of common drinking, eating and toilet facilities. In the supervision of dairy farms and the dairy industry, inspection of the farms averaged from June 30, 1915, to June 30, 1916, 3.38 times, while individual cows were inspected on an average of 3.14 times during the year. In the latter connection, of the cattle tuberculin-tested, only 4.05 definitely reacted to the test in 1916, as against 9.18 per cent. in 1915. Excellent results have also been accomplished in all other branches of this service.

The report itself is profuse with tables, and fortunately such an extensive index is supplied that one may very readily find whatever particular data they require. It indeed must be disturbing to note a seeming increasing death-rate and at the same time to be unable to combat it from ignorance of the nature of the cause, and we extend to Doctor Woodward every wish of success in settling this unusual condition.

NOTES.

New York Health Department Urges Increased Use of Anti-Pneumococcus Serum.—The New York City Department of Health through its January 13 weekly *Bulletin* again calls to the attention of physicians of that city the availability of anti-pneumococcus serum. This is greatly prompted by the unusually good results obtained at the Hospital of the Rockefeller Institute in pneumonia due to pneumococcus Type I by the use of this serum.

Serum will not be given out, however, except for determined cases, since the serum is only active against pneumococcus Type I. The Department is willing, however, to determine the type of pneumococcus for the physician if sputum from cases of pneumonia is collected and sent in to it. The *Bulletin* describes the exact procedure for such collection and transmissal.

The types of pneumococci found in pneumonia have been determined by animal protection tests and these results are paralleled by agglutination results. To quote the *Bulletin*:

"The latter method, therefore, can be employed for routine determination. It has been found that three distinct types, I, II, and III, cause about 75 per cent. of all cases of pneumococcus lobar pneumonia. The remaining 25 per cent. are caused by members of a heterogeneous group, called for convenience Group IV, the members of which have no relationship one to the other in their serum reactions. Type III is the organism known as the pneumococcus mucosus. A serum against one type protects and, therefore, has therapeutic value only for infections caused by the same type. In the case of Group IV a group serum is evidently impossible. The therapeutic use of sera for Types II and III has not been sufficiently satisfactory to warrant their general application. The following table gives a general idea of the incidence of the different groups or types in pneumococcus lobar pneumonia. As is evident from the two sets of observations, the prevalence of the different types will vary from year to year.

	Types or Groups.			
	I.	II.	III.	IV.
	Per cent.			
Reported by Cole (1914), 72 cases	47	18	14	21
Dept. Laboratories (1914-15), 41 cases	24	42	10	24

"Administration of the serum is by the intravenous route. The average dose for an adult is 100 cc. This is allowed to flow into the vein by gravity and it may be diluted with sterile saline solution. The serum and saline should enter the vein at the body temperature, and after a few drops have entered the vein it is well to wait several minutes for any symptoms referable to the respiratory or circulatory system indicating hypersensitiveness. The remainder of the serum is then allowed to flow in very slowly. Cole advises the subcutaneous injection of about 0.5 cc. of serum when the sputum is collected to determine whether hypersensitiveness is present. A small vial of horse serum for this purpose can be obtained when the sputum is delivered to the laboratory. The dose is repeated depending on the response and the clinical condition of the patient. Two or more doses may be given at intervals of 12 to 24 hours. Some rise of temperature with subsequent fall follows practically each injection, although the lowering in temperature may be only temporary. If the serum is not sufficiently warm and is injected too rapidly, chills usually occur. Even when it is given properly, chills develop in about one third of the cases.

"Physicians receiving the serum for the treatment of any patient are expected to supply certain simple records of the history of the case and the subsequent course of the disease."

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Provincial Supply of Antitoxin.—The Provincial Board of Health for Ontario will, at the end of the present month, complete a year's contract for the supply of diphtheria antitoxin, tetanus antitoxin, antimeningitis serum, smallpox vaccine and Pasteur preventive treatment for rabies. These, as well as mixed typhoid and paratyphoid vaccine, are supplied free to the public all over the province. Diphtheria antitoxin costs the Board 15 cents per 1,000 units, in vials, tetanus antitoxin, 30 cents per 1,000 units, in vials, anti-meningitis serum, $1.00 per 20 cc., smallpox vaccine, 4 cents per capillary tube and Pasteur treatment, $15.00 per person treated. Mixed typhoid and paratyphoid vaccine is prepared and supplied free by the Board's Laboratory, in Toronto. The aggregate cost of supplying the province for the year is about $40,000, or about one quarter of the cost under commercial prices. All these products except typhoid vaccine are obtained from the University of Toronto and are prepared at the Connaught antitoxin laboratories about 12 miles outside of the city. Needless to say, the enterprise of the Board is the subject of many appreciative remarks by the public and the medical profession.

Since the war began the Board has supplied all the typhoid and paratyphoid vaccine used by the Canadian troops (some 400,000 doses) free of charge.

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Mortality from Cancer and other Malignant Tumors.—The mortality from cancer and other malignant tumors in the death-registration area of the United States has been increasing almost continuously for the past fifteen years. It is greater in urban than in rural localities; among females than among males; among whites than among Negroes; and among persons in middle life and old age than among those in early life. Deaths due to cancer of the stomach and liver represent more than three eighths of the total.

These are among the significant facts brought out in a special report, "Mortality from Cancer and Other Malignant Tumors in the Registration Area of the Unites States, 1914," soon to be issued by Director Sam. L. Rogers of the Bureau of the Census, Department of Commerce.

The total deaths from cancer and other malignant tumors throughout the Registration Area (which contains approximately two thirds of the total population of the Unites States) in 1914 numbered 52,420, corresponding to a death-rate of 79.4 per 100,000 population. This figure represents an almost continuous increase—amounting to 26 per cent. for the entire period—since 1900, when the rate was 63. How much of this increase has been due to more accurate diagnoses and greater care on the part of physicians in making reports to registration officials, and is thus apparent rather than real, it is impossible to estimate. For registration cities having 10,000 inhabitants or more in 1910, the rate averaged 88 per 100,000, but for smaller places and rural localities in the registration states it averaged only 69.6.

Among the states, the lowest five rates—45.8, 46, 48.9, 51.5, and 57.8 per 100,000 population—are shown for Utah, Kentucky, Virginia, Montana, and North Carolina, respectively; and the highest five—109.9, 107.6, 101.2, 100.8, and 97.9—for Vermont, Maine, Massachusetts, New Hampshire, and California, respectively. (The rate for North Carolina relates only to places which had 1,000 or more inhabitants in 1910.)

At least a part of the difference between the high and low rates is accounted for, first, by the fact that in some states the average age of the population is considerably greater than in others, cancer being a malady much more likely to attack persons at advanced ages than those in the earlier periods of life, and, second, by the fact that in several of the states named there are considerable proportions of colored population, among whom the mortality from cancer is apparently lower than among whites.

The death-rate for whites throughout the registration states was 80 per 100,000 as against only 56.2 for the colored population.

The death-rate from cancer among women, 96.8 per 100,000, was more than 50 per cent. greater than the corresponding rate for men, 62.4.

For persons under 25 years of age the death-rate was only 2.8 per 100,000 corresponding population; but for the higher ages it is very much greater, increasing rapidly from each age group to the one next above. Thus, for persons 25 to 34 years of age, it was 13.9 in 1914 for those 35 to 39, 42; 40 to 44, 78.6; 45 to 49, 128.6; 50 to 54, 199.7; 55 to 59, 305.9; 60 to 64, 393.1; 65 to 69, 516; 70 to 74, 672.3; 75 to 79, 766.6; 80 to 84, 889.6; and 85 and over, 875.6.

Among both males and females, cancer of the stomach, liver, pharynx, and esophagus accounted for a greater proportion of the total deaths from cancer—approximately 47 per cent. among males and 32 per cent. among females—than is shown for any other group. The death-rates from this class of cancers were 29.6 per 100,000 for males and 30.7 for females.

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Police, Fire, and Health.—Frequently one notices a comparative statement of the appropriations for the various departments of municipal administration, where oddly enough the health department always receives the smallest amount. Usually, however, only the appropriations are mentioned, and we do not find a comparative statement which includes more than discrepancies in amounts appropriated. It is indeed ingenious and effective for a health officer to study a year's records to determine the property and human life lost and saved by the several departments. In the city of Cumberland, Md., as reported by the January *Bulletin*, the appropriation for the police, fire, and health departments were $22,000, $17,000, and $5,000, respectively. It is to be remembered that the work of the police and fire departments is entirely bent towards eliminating conditions after they have become a menace to the safety of the public. The work of the health department is almost entirely preventive. In this city, during 1915, the fire department attended 78 fires with a total property loss of under $38,000, with no persons injured or killed at any of these fires. During the same year the police department arrested 1,825 persons from whom the sum of $3,558 was exacted as fines. It has been difficult to compute the savings made by the health department in any one year, but it is known that had the death-rate of 1910 prevailed during every succeeding year to 1916 that over 500 more persons would have died, also laboratory examinations made at the municipal laboratory cost only $300, where if done at a commercial laboratory they would have cost $10,000. It is estimated that the activities of both the police and fire departments will prevail in about the same degree as in 1915. The point which the health department wishes to emphasize is the fact that for the amount of actual results obtained, the health department stands way above that of the police or fire department provided of course that the health department maintains its efficiency, yet not near as much money is appropriated for the latter as for the former. While this argument is undoubtedly fallacious in certain respects, the discrepancies in the several appropriations can hardly be disregarded.

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Possible Extension of United States Registration Area.—At Nashville recently the Tennessee State Board of Health was investigated by representatives of the Division of Vital Statistics of the United States Census Bureau for the purpose of determining whether or not Tennessee is eligible for admission to the United States Registration Area.

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Health Protection Accomplishments in Dallas, Texas.—It appears to the health department of Dallas that the most important accomplishment of organized health protection work is the development of a city-wide appreciation of the importance of such work, and of its economic and financial value to the community. With such an introduction there are enumerated in the January monthly bulletin of the department some of the specific health protection accomplishments to date, which are indeed commendable. The list is as follows:

First.—The health records of the city have been perfected to such an extent that they are now accepted by the federal government.

Second.—There has been a decided reduction in summer typhoid in Dallas. In August, September and October, 1916, only seventeen cases were reported, as compared with 113 cases during these three months in 1914.

Third.—The prevalence of children's diseases during the first three months after school opens has been materially reduced. In September, October and November, 1916, only 63 cases of diphtheria and scarlet fever were reported in the city, as compared with 160 cases of these diseases in the same three months of 1915. During the four weeks following the state fair in 1916, there were only 20 cases of diphtheria and scarlet fever, as compared with 70 cases in the same period in 1915. Only 26 cases of small-pox were reported in Dallas in 1916, as compared with 600 cases in 1914.

Fourth.—Over 500 dairies selling milk in Dallas are now operating under permits. These dairies furnish practically all the milk sold in the city. The sanitary scores of these dairies have shown a very decided improvement during the past year. Adulteration of milk has been largely stopped. Very little milk is now imported into the city from outside the county. Tuberculosis has been practically eliminated from among the dairy cows. The minimum sanitary score allowed for dairies has been raised from 60 to 70. The number of dairies scoring better than 80 has been increased very materially, and these dairies now supply a large per cent. of all milk sold in the city. Milk buyers are learning to visit dairies and examine for themselves the sanitary conditions. The department has had more than 9,000 requests for information about dairies during the past twelve months. The custom of bottling milk on the streets or in stores has been stopped. Milk bottles may no longer be collected by dairymen from premises where there is contagious disease. The health department has received throughout the year active coöperation in all of this work from the Dallas County Dairymen's Association. Milk consumers should continue to secure from the department every few weeks information regarding the sanitary score of their milk producer and dealer, because in spite of the improvements already secured, and of the efforts to maintain these improvements, the sanitary conditions at individual dairies will sometimes fall below the desired standard.

Fifth.—Much less bad food is now being offered for sale in Dallas. In August, September and October, 1916, only 3,000 pounds were condemned and destroyed by the department, as compared with 75,000 pounds during the same three months in 1915.

Sixth.—During the past twelve months 900 unsanitary dry closets, each of which was a possible means of spreading contagious disease, have been entirely abolished. Two thousand two hundred other dry closets which cannot now be abolished, due to lack of sewers, have been made fly-tight during the same period.

Seventh.—As a result of systematic malaria investigations it has been determined definitely that there is a large amount of this disease in Dallas city, and the adjacent territory. In certain localities 25 to 30 per cent. of the people examined were found to be infected with the disease. Practically all the malaria mosquito-breeding places within the city limits have been abolished, or are now under treatment.

Eighth.—Three private sewers serving a comparatively large number of residences, and which formerly discharged into a stream above a certain park where children played in the water, have now been connected with the city sewer system, thus stopping the pollution of the stream.

A Solution of Small Town Health Problems.—An excellent argument for the grouping of small towns and surrounding territory into a unit for health work is made by the California State Board of Health in its January monthly *Bulletin*. Under the present laws of California every incorporated town, no matter how small, must maintain a board of health and a health officer. In too many instances this gives rise to a "foolish official farce." The result is that the pound man or the fire chief is made health officer and is immediately called "Doc" by admiring fellow townsmen. The small amount of money which the town could afford to pay for preservation of its health would not possibly tempt a physician or public health expert. As a consequence of this fact the California State Board of Health most earnestly recommends the grouping of towns and surrounding territories into a unit which shall secure the services of a full-time health expert, and in this manner such a district could obtain all the public health service that is now enjoyed only by the larger cities at a low cost. To accomplish this in this state it is necessary that an enabling act be written from the statutes by the Legislature. Indeed, as the *Bulletin* puts it, "Such a measure deserves the support of the people of every small town and surrounding territory who have an interest in their community health."

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State Health Districts.—In order that all citizens in every part of California may secure equal advantages in the conservation of public health, the California State Board of Health proposes an enactment of a law for the formation of six health districts covering the entire state, the health affairs of each district to be in charge of a state health officer, who would be constantly in touch with local health officers and would assist and direct them in the enforcement of the state health laws and the regulations of the State Board of Health. Such is the plan as indicated by the January *Bulletin* of that State. It is suggested that at the time of epidemics he would take charge of control measures and decide whether the more highly specialized experts of the Board would be needed. Furthermore, he would inspect the sanitary conditions of cities and rural districts, order the correction of insanitary conditions, act as local field representative for various bureaus of the Board, and bring about more nearly complete disease and birth registration. He would consult with local communities relative to the need for enactment and enforcement of health ordinances. He would come quickly to the assistance of a health officer when a consultation is needed relative to diagnosis and control measures and outbreaks of communicable disease. The same bill also makes provision for the appointment of ten sanitary inspectors to carry on field work, inspect summer resorts, make sanitary surveys of towns, and improve rural hygiene. Their services would also be available for emergency work in the control of epidemics. The population of the proposed districts vary from about 210,000 to 350,000. This bill, if enacted, is indeed a most remarkable advance in public health administration and should go far in producing the desired coöperation and greater and more efficient health service.

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The Problem of Ventilation.—The difficulties accompanying the maintenance of proper ventilation in public places, particularly on vehicles of transportation, are briefly though effectively set forth in the current weekly *Bulletin* of the Cincinnati Board of Health. This *Bulletin* first refers to its own particular problem, which is the ventilation of trailer cars of the Cincinnati Traction Company. The Department of Health has been informed by the Traction Company that three windows in the front and three in the rear of these cars are being so altered that fresh air can be admitted in abundance. The effectiveness of such changes as with all changes of this nature will now depend upon the Traction Company, its employees, and the public, all three of which seem to have equal responsibility in the matter.

It is pointed out that the Traction Company must consider larger coal bills and they naturally desire to keep this item of expense as low as possible. The employees are given orders concerning ventilation but do not always obey them. And the public has its own ideas about ventilation which frequently result in clashes between the passengers and the employees. It is possible for the passengers to report unimproved ventilation, but the public has so many ideas on this question, often radically opposite views from one another, that satisfaction is difficult to obtain. It is indeed true, as the *Bulletin* states, that the problem is one with many angles.

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Health in New York City during 1916.—The Department of Health of New York City also publishes a brief résumé of its health during 1916 in the weekly *Bulletin* of January 6. Notwithstanding the epidemic of influenza and infectious colds and the epidemic of poliomyelitis which visited this city during 1916, the death-rate for the year is the lowest on record, to wit: 13.89. It is indeed remarkable to note the steady reduction in death-rate which this immense city has maintained since 1900 when the rate per 1,000 population was 20.57. The 1916 rate is based on an estimated population of 5,602,841 with a total toll of 77,801 deaths. It is stated that this gradual lowering of the death-rate has been accomplished through the reduction in mortality in the early years of life. In addition the incidents in the mortality of the acute infectious diseases has been lower. During 1916 the infant mortality rate per 1,000 reported births has been reduced to 93.1 as compared with the rate of 98.2 for 1915, and the rate of 125.6 for 1910. The death-rate from typhoid fever as reported for 1916 is .04 per 1,000 population as compared with the rate of .06 for 1915. Poliomyelitis caused 2,448 deaths in 1916 as compared with 13 for 1915. Reductions in death-rates were noted in the case of tuberculosis (pulmonary), measles, scarlet fever, diphtheria and croup, while the death-rate from the diseases of middle life, pneumonia, and whooping-cough remained about the same or increased slightly.

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Wider Jurisdiction for City Health Officers.—According to the December *Ohio Public Health Journal* of the State Board of Health, Dr. T. C. Miller, Health Officer of Massillon, advocates giving city health officers jurisdiction over families whose children attend the city schools. At present the city health officer's authority ends at the city limits, although the city school district extends into an adjoining township. It is felt that frequently the health administration in such townships is lax. As a consequence of such lax regulations children from township homes where there is disease may come to the city school and mingle with the other children, thus possibly causing an epidemic even in a carefully guarded city, annulling the efforts of a vigilant municipal health officer. According to the Ohio publication this suggestion is worthy of consideration. To give the city health officer jurisdiction it would be necessary to change the present law, but if a satisfactory measure could be drawn up such a change might be effected.

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Sanitary Scoring in Cleveland.—The score card system as an index of sanitation is to be further developed this year by the Cleveland Department of Health according to the January *Health Bulletin* of that city. This scoring will apply particularly in places where food is either sold or served. White cards are to be issued when the store or restaurant scores above 90 points. Blue cards are to be given when a scoring above 80 points is made. Red cards will be given when sanitary conditions fall before 80 points. As yet in Cleveland there is no legislation which requires a grocer or restaurateur to post these cards, but it is believed that the possessor of one of the new white cards will be anxious to display it and in places where the other cards are issued it is felt that the proprietors will attempt to attain a better score, since it is certainly to their business interest. The scoring is done by inspectors from the city bureau of laboratories. Under the scoring system the condition of salesrooms counts for 32 points; rear rooms, 36 points; toilet rooms, 20 points; cellar and basement, 8 points; and rear lot and out-buildings, 4 points.

During 1916 the 2,154 grocery stores inspected had an average of 88.7 points, and 575 restaurants averaged 88.5.

Health in Boston During 1916.—The December monthly *Bulletin* of the Boston Health Department contains a résumé of the activities of this department during the past year, and it is felt that the results accomplished in preventive medicine afford much hope and encouragement for even better results during the coming year. One of the most commendable results accomplished is from the campaign against typhoid fever, and in 1916 Boston showed the lowest number of deaths and the lowest death-rate from typhoid fever in its history. The 1916 death-rate from this disease deducting non-residents was 2.5 per 100,000. The death-rate for the year 1916 was 16.74 per 1,000 as against the rate of 16.06 for 1915. Increase in deaths are noted among the following diseases, measles, tuberculosis (all forms), poliomyelitis, pneumonia, influenza, and disease of middle age. In this connection it is interesting to note that the death-rate from poliomyelitis increased from .4 to 21.96 per 100,000 from 1915 to 1916. Decreases in deaths were noted in the case of diphtheria, scarlet fever, and whooping-cough. The total number of deaths shows an increase of 703 over the previous year. It is felt that this can be partially accounted for by the fact that each year more non-residents take advantage of the hospital facilities offered by Boston, and as these deaths must be figured in the death-rate it is obvious that they would increase the true rate. For example, 155 more non-residents died in Boston in 1916 than in 1915. The increase in rate is further accounted for by the severe outbreak of influenza and pneumonia in the early part of 1916 which was responsible for an increase of 200 deaths. To this increase may be added the 164 deaths from poliomyelitis and 48 more deaths due to an unfortunate electric car accident.

Public Health Notes.

In Rebuttal to Dr. Fishberg.—Last month there appeared in these columns a review of an article on "Traditional Fallacies about Tuberculosis," which was contributed to the *New York Medical Journal* by Dr. Maurice Fishberg. The author dealt very harshly with ten or so beliefs on the subject of tuberculosis, which are more or less commonly held as true. Several letters appearing in subsequent numbers of the journal in question indicate that Doctor Fishberg has stirred up a hornet's nest, as is evidenced by the following introduction to a reply contributed by Dr. A. Robin of the Hope Farm Sanitorium for Consumptives, Wilmington, Del.:

"Now and then some one who is outside the great movement against the white plague steps into the limelight and indulges in a few oratorical flings at the 'crusaders.' The flings do not hurt the crusaders, nor do they materially affect the world-wide crusade; but they furnish some sort of ammunition to the objectors, give courage to a lot of Rips who slumber while dreaming the dreams of the past, and, what is worse, disturb the mind of the layman whose judgment is easily distorted by conflicting opinions and whose natural inclination is to follow the leadership of those who are opposed to restrictive measures of any kind. For such people Doctor Fishberg's article will serve as a pillar of support.

"Doctor Fishberg dismisses many a live medical problem by the convenient term 'fallacy.' To the 'fallacies' that he discovered in relation to tuberculosis we will attempt to add one more, and that is the fallacy of his reasoning."

The greatest objection is directed toward that portion of Doctor Fishberg's paper which maintained that since the great majority of children showed by reaction to tuberculin that infection is contracted early in life, and since over 90 per cent. of autopsies showed healed tuberculous lesions in the lungs, it was evident that escape from the *disease* tuberculosis was due to active immunity produced by early infection, and further, that fatal cases were due to failure of the patient to overcome these early infections, rather than to new infection in adult life.

Not only correctness of the conclusions of Doctor Fishberg are disputed, but also the accuracy of the premises upon which they were based. It is denied that the lesions demonstrated by the autopsies were shown by careful histological studies to be really tuberculous, and that the mere presence of acid-fast bacilli in the lungs is not indicative of B. tuberculosis—least of all of *living* bacilli.

It is further denied that almost all children react to tuberculin, the experience of the writer being that only 60 per cent. to 75 per cent. react, the belief being that even of these many were due not to tuberculous infection, but to inherent or acquired sensitiveness to tuberculin.

In view of these things, the stand of Doctor Fishberg that adults are not subject to re-infection, and that efforts to prevent the same are time and money wasted, is held unproven.

✠

A Mental Examination in Open Court.—June E. Downey, psychologist at the Wyoming State University, writes in the *Survey* for January 13, 1917, an account of what is believed to be the first psychological examination held in a court room according to the standardized methods of the laboratory.

A young man, James Howell, had been confined in the jail at Rawlins, Wyo., for a misdemeanor, and under suggestion of two fellow prisoners, had killed the jailer in an attempt to effect escape. Howell was indicted, and his attorney, finding that the prisoner was suffering from the *dementia precox* type of insanity, obtained permission from the court to have the Binet test performed before judge and jury, the result being that, instead of a criminal, Howell was shown to be brain-sick, his mental powers corresponding to those of a child six or seven years old.

The psychologist's account of the trial is very interesting:

"Imagine the attentiveness of jury and spectators as the questioning began with the tests for the three-year-old child. I realized that this beginning might make the whole affair seem absurd, since the normal adult, and even the child of eight or nine, finds these questions ludicrously simple; but Howell answered with the *naïveté* of a very small child. He pointed with perfect solemnity to his eyes, nose and mouth, and repeated after me, 'It rains, I am hungry.'

"One question asked the four-year-old is whether he is a little boy or girl. For Howell I varied the question a trifle, asking whether he was a man or a woman. To my surprise the answer came hesitatingly, 'I dunno; I ain't thought much about it,' at which a ripple of excitement passed over the court room. Later I put the question in the usual form and Howell answered, 'Boy.'

"The child of seven or eight years is able to repeat five digits, but Howell was unable to give more than three, the digit-span of the four-year-old child. Again and again he tried to retain four digits; he would name them on his fingers as a little child might have done, but always in reproducing them he found that when he reached the fourth finger his bird had flown.

"One of the Binet tests exhibits the capacity of a child to comprehend what should be done in a given situation. Asked what he ought to do if he were going somewhere and had missed his train, Howell said, 'I'd run,' and he insisted that he could run any distance. He would also run if he had broken something that didn't belong to him, or if someone should ask him his opinion of a person whom he knew only a little. Another test involves seeing an absurdity in a statement. For example, you ask the eleven-year-old child to point out what's wrong in the statement: 'I have three brothers—Paul, Ernest and myself.' The average child retorts, 'He says he's his own brother!' In the cell examination Howell answered, 'He didn't say how many sisters he had'; in the court examination he answered, That's all right!'

"It was the same throughout the examination. Shown a picture of a man presumably in prison and looking wistfully out of the window, Howell manifested not a flicker of emotional interest. He merely enumerated a few objects that he saw and, because the foreground was light, spoke of 'Heaps snow,' with no consciousness of the fact that the scene was indoors."

The verdict of the jury was "insanity" on the first ballot. Aside from preventing the brutal hanging of an imbecile, the case is believed by Miss Downey to have been of distinct service in bringing before the court, not only the conclusions of the mental diagnostician, but also evidence and scientific methods upon which they are based. Secondly, it brings vividly before the public the need of more wide-spread mental examination of so-called criminals, and the early discovery of those who are likely to come into that class unless properly cared for.

⁂

The Etiology of Poliomyelitis.—Horace Greeley of New York reports the isolation from specimens of brain and cord tissue taken from eight poliomyelitis victims, of a non-filtrable polymorphic bacterium.

Plants from the brain and cord gave a "streptococcus-like" organism, staining Gram-positively. Subsequent subcultures on blood-serum, washed with bouillon-limewater-lactose yielded a bi-polar bacillus, the poles of which were Gram-positive to a varying degree. A return from the bacillus to the "streptococcus-like" form could be accomplished by re-planting upon hydrocele-bouillon-limewater medium.

The organism seems to be identical with that isolated previously from similar tissues by Flexner and Noguchi, Rosenow, and others.

Injected into cats and rabbits, the organism produced a variety of symptoms. All of the cats showed sneezing, mucus discharge from the nose, and progressive weakness—symptoms similar to those described as cat distemper by veterinarians. Two showed pronounced paralytic symptoms, but the rest showed none beyond a passing weakness of different muscle groups. However, in a large proportion of the cases, the animals died and the organism could be recovered from the meninges.

Through an accident, a portion of the culture was squirted into the eye of the investigator, and, in spite of washing out with silver solution, was followed in about seventy-two hours by soreness of the throat and nose, digestive and nervous disturbances. Scrapings from the swollen post-pharyngeal mucous glands yielded the organism of the experiment.

A noteworthy discovery was that the organism could withstand the temperature of milk pasteurization and the author thinks that milk may be a factor in the transmission, although "for milk to be held responsible for many cases we might have to incriminate the cow as a potential 'carrier' of the germ."

"The remarkable way in which the spread of the malady is affected by the atmospheric temperature; the experiments detailed in reference to the growth of the organism at temperatures known to prevail when the disease is at its height, and its ready growth in milk and resistance to the pasteurization process, together with the case incidence among the children of milk drinking age, all strongly indicate that milk may be a very important factor in the spread of poliomyelitis."

Another hypothesis speculated upon is that there may be several organisms in the poliomyelitis group, some prevailing in diseases of the lower animals. Prior and co-incident epizoötics have been reported in connection with "polio" outbreaks, and it is believed that this hypothesis would help to explain the rural sporadic cases, and the greater number of attacks among males in this country, especially among adults.

The article appears in the *Medical Record* for January 13, 1917.

✠

The Prevalence of Venereal Diseases in Canada.—A pamphlet under the above title, recently issued by the Commission on Conservation of Canada, presents certain salient facts and figures which prove conclusively that the time has come in the Dominion to establish drastic legislation to combat the venereal peril.

In the introduction by Professor Clarke of the University of Toronto it is stated that:

"When it is learned that more than 12 per cent. of the patients admitted to the public wards of the Toronto General Hospital, for various diseases, medical and surgical, have syphilis, it will be realized that we are dealing with an acute situation, as the facts which apply to that institution are merely an index of the prevalence of syphilis in the community.

"The menace to the health of the nation is perhaps greater than that of tuberculosis. If registration of the tuberculous is desirable, the same argument is doubly applicable in the regulation of syphilis."

Professor McKensie of the Department of Pathology of the same university discusses the pathological aspect of syphilis, and significantly states that "Although the immediate effects of venereal disease on the individual are serious enough, their great importance from the standpoint of race conservation lies in their delayed effect upon the individual and his or her offspring."

The Bordet-Wassermann reaction is well discussed by Prof. H. K. Ditweiler, who states that by means of this test 98 per cent. of all cases of syphilis can be detected. In applying this test to new patients of the Toronto General Hospital it was found that 12 to 14 per cent. of admissions were syphilitic. Sixty-six per cent. of these were not suspected of suffering from this disease for the reasons that (1) syphilis is a mimic and can simulate almost any known disease; (2) there is a so-called latent stage of syphilis, in which the patient shows no evidence of being infected—feels well, looks well, and on physical examination exhibits no lesions. Yet that patient is a menace to the community on account of his or her ability to infect others, or to bring syphilitic children into the world. Then again, such a patient is living on the crater of a volcano, for the dormant infection may light up at any time.

After discussing the astounding prevalence of this disease among the civil populations abroad and in this country and in the United States army, Dr. C. H. Hair, chief of the Toronto Special Treatment Clinic, gives statistics of the prevalence of the disease in the province of Ontario. It is found that according to the 1915 registrar general's report only forty-eight deaths are attributed to syphilis, and four to gonorrhea. However, since many other diseases result from syphilis, 1,367 additional deaths can be attributed to this cause.

To quote further:

"During the past thirteen months a syphilitic treatment clinic has been conducted in the Out-Patient Department of the Toronto General Hospital, the patients being referred from the other clinics and the results give a fairly accurate idea of the prevalence of the disease; 152 clinics have been held and 373 patients have been treated. Of these 28, or 8 per cent. only were treated in the primary stage of the disease; 70, or 18 per cent. in the secondary stage, and 206, or 55 per cent. in the later stages of the disease. The remaining 69 cases were, congenital 7, quiescent 24, not classified 38.

"Since October 6, 1916, routine Wassermann tests have been done in the wards of the Toronto General Hospital, and out of 971 tests 125 have shown positive syphilis, between 12 and 13 per cent."

In discussing gonorrhea, it is stated that of the 329 operations at the Toronto General Hospital in the past year over 12 per cent. were undertaken for the relief of conditions directly due to gonorrheal infection, 28 of such sufferers being married and 12 single. Taking into account major operations, 25 per cent. were performed for gonorrheal complications.

Prof. William Goldie of Toronto, in setting forth the conclusions and principles of contro of this problem, includes the following essentia features in such control:

1. Non-public registration;
2. Public registration and isolation of recalcitrants;

3. Free treatment for all who apply for it;
4. Free tests;
5. Supervision of mental deficients;
6. The administration of the plan by a Dominion body through the Provincial Board of Health.

*

Health Departments and Liquor.—"I venture to predict that no advance in the control of preventable disease of bacterial or infectious origin in the future could accomplish such reduction of the morbidity and mortality of the community, as would undoubtedly follow the elimination of alcohol as a beverage."

So says Haven Emerson, health commissioner of New York City, writing in the *Boston Medical and Surgical Journal* of January 18, 1917.

He states further that the records of his department show that no less than 2,000 deaths are admittedly due to the excessive use of alcohol, and that 8,000 cases of acute alcoholism are treated annually at Bellevue Hospital, New York.

He enumerates three classes of diseases from the sanitarian's point of view:

First, communicable diseases;

Second, diseases of occupation;

Third, disorders of development and function resulting from people's habits in their home or personal life, their habits of housing, eating, clothing, exercise, recreation.

Under the last heading comes alcohol, and Doctor Emerson holds that it is the duty of health departments "to teach, teach, teach, persuade, demonstrate, exhibit, exhort, prove that alcohol as a beverage, or in patent medicines is a menace to personal and community health, is a common source of sickness and death, is blocking the path of preventive medicine and is a danger to the physical and social development of the nation."

*

The Organism of Rocky Mountain Spotted Fever.—S. B. Wolbach, writing in the *New Orleans Medical and Surgical Journal* for January, states that a parasite has been found in proved infected ticks in large numbers, morphologically identical with the parasite found in the lesions of guinea pigs and monkeys infected with Rocky Mountain spotted fever.

There are two principal morphological forms, one a lanceolate diplococcoid organism, and a smaller rod-shaped form.

In testing for the infectivity of the ticks, each one was enclosed in a wire gauze capsule, fastened to the shaved abdomen of the pig with adhesive plaster. The parasite was found not to occur in ticks thus shown not to be infective, but only in those proved to be infective?

Transmission occurs by way of the salivary gland secretions. Transmission by fecal contamination of the wound does not seem possible, as the feces come in the form of small balls, which soon become hard and dry, and do not soil the skin of the guinea pig.

*

Health Publicity and "Punch".—W. F. Thompson is both canny and happy when he writes as follows:

"Only those problems which deal with the prevention of disease need be discussed in the newspaper column. Reference to diagnosis and treatment, except when used in a preventive sense, has no place in the lay print.

"Discussions on health topics, to be read and digested with the breakfast food, must be short. They must be so short that the modern, restless reader may glean the gist at a glance. Long winded, semi-scientific dissertations are invariably skipped for the more entertaining 'Mutt and Jeff,' or the sporting page. Every mail brings to every editor's desk long columns of public health stuff, in bulletin form, that could be easily expressed in short paragraphs. Needless to say that only terse articles, conveying clear messages in few words, are selected."

The article, "Publicity in Public Health Work," appears in the *Texas State Journal of Medicine* for January, 1917.

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Health in Belgium.—A report on the health conditions in Belgium under the German occupation, the result of a special study made at the request of the Commission for Relief in Belgium, is given by W. P. Lucas, San Francisco (*Journal American Medical Association*, January 6, 1917). In this investigation he had the aid and counsel of Belgian physicians and surgeons, and a freedom of movement which under existing conditions is not possible to them. The objective of the inquiry was to determine the results of the relief that has been given and what changes might be desirable and were possible under the circumstances. Dividing the population into the well-to-do or so-called upper classes, the agricultural classes, and the industrial and minor commercial classes, the first two of which comprise about 35 per cent. and the latter over 60 per cent., he finds that in the former, health conditions are fairly good and the enforced economy and temperance have probably had favorable results from the health point of view. Furthermore the almost universal response of the first class to the calls for need has helped in giving stimulation and occupation. The agricultural classes have not seriously suffered in health conditions, but in the third class, the industrial and minor commercial class, embracing about 5,000,000 people, the case is different. Their food supply is very close to the absolute necessities of nutrition. Lucas especially notices the tuberculosis situation which may be considered as directly connected with the unfavorable nutrition conditions. Undernutrition is having its results in the increase of tuberculosis, which is easily realized when one considers that the average daily consumption of fat lies somewhere between 20 and 30 gm. per individual, which is far too low. The growing lack in milk supply is another factor in the nutritional problem, and the diminution in the native supply of vegetables and fruit during the coming winter will undoubtedly unfavorably influence the tuberculosis situation. The increase in the tuberculosis clinics is marked. Every sanatorium is crowded; the waiting lists are larger, and the cases more acute than before the war. Statements from various hospital authorities are quoted supporting this statement, and the increase is progressing. The number of cases in the schools is especially marked in the large centers, and it is difficult under present conditions to carry out any anti-tuberculosis campaign. Already all throughout Belgium the milk supply is deficient and of poor quality, and will be still further diminished during the coming winter. In the general adult population as well as in the school children, it is the opinion of those competent to know that the efficiency of the workingmen and laborers is markedly decreased. Another keen index of the abnormal condition in the lower classes is the diminution in maternal nursing, showing a general lowering of health and vitality of mothers. As in other warring countries, there is a great diminution in the birth rate. In children rickets has increased markedly, but infant mortality has fallen since the beginning of the war excepting in one or two large industrial centers. Institutions for directly feeding children have been greatly increased in number, and their efficiency is noted. On the whole he does not consider that the general health situation is a gloomy one under the circumstances. The well-to-do and agricultural classes are fully up to the normal, and while there is quite an amount of privation in the industrial and minor commercial classes, as a result of the relief organization the adult population is in a position to quickly recover its normal condition, and the special attention that has been given to care of children and adolescents has resulted in an actual improvement in infantile conditions in some respects. Excepting for the increase in tuberculosis and an epidemic of grip last winter and spring, the population has been singularly free from epidemics and contagious disorders. Lucas speaks highly of the skill and devotion of the medical profession in Belgium, and the magnificent work which has been performed by the women of Belgium in the care of the children. The maintenance of the relief organization is an absolute and daily necessity, and its cessation for a single month would bring a physical disaster to the industrial and lower commercial classes of the country.

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The Payment of County Registrars.—*Public Health Reports* for January 5 outlines a decision of the Arkansas Supreme Court that local registrars are state officers, and that their compensations should not be paid by the counties.

"In 1913 the legislature of the state of Arkansas passed a law providing for the appointment of local registrars of births and deaths by the state registrar of vital statistics and for the payment of local registrars by the counties on certification by the state registrar that prompt reports had been made to him.

"The supreme court of Arkansas has decided that under the constitution of the state the counties cannot be required to pay the local registrars, as they are considered to be state officers. This feature of the law has, therefore, been declared unconstitutional."

*

Implied Warranty in the Sale of Foodstuffs.—"An interesting decision of the Supreme Judicial Court of Massachusetts is published in the issue of the *Public Health Reports* of December 22, 1916. A Massachusetts man and his wife were made ill by eating pork, and they brought suit for damages against the dealer who sold the meat. The court states the facts as follows: 'His wife [the wife of the purchaser], acting as his agent, left to the defendant the selection of the meat, and paid for it at the current price for sound, wholesome pork chops. . . . The defendant Freshman undertook to make the selection so left to him. The meat was cooked, and was eaten by the plaintiff and his wife, and both were made sick.'

"The law of Massachusetts applicable to the case was stated in the opinion as follows: 'Where the buyer at a shop relies on the skill and judgment of the dealer in selecting food, and it is made known to the dealer that his knowledge and skill are relied on to supply wholesome food, he is liable if it is not fit to be eaten; while, in case the buyer himself selects provisions, the dealer's implied warranty does not go beyond the implied assertion that he believes the food to be sound.'"

"The court decided that the husband was entitled to damages, but the wife could not recover because 'the only sale was that made to her husband through her as his agent,' and 'there was no contractual relation, and hence no warranty,' between her and the defendant."

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Health Hints of 1756.—Smollett was born in 1721. About 1756 he wrote a book, "Humphrey Clinker," which was very popular in its day and is still read. The work takes the form of a series of letters written his friends by an English traveler. Many of the letters are to Doctor Lewis.

His views on vacations can be inferred from the following: "I have ever found a change of company as necessary as a change of air to promote a vigorous circulation of the spirits, which is the very essence and criterion of good health."

That infection was recognized in that day is shown by the following: "We cannot even sleep without risk of infection. I say infection—this place is the rendezvous of the diseases—you won't deny that many diseases are infectious; even the consumption itself is highly infectious. When a person dies of it in Italy the bed and bedding are destroyed; the other furniture is exposed to the weather and the apartment is whitewashed before it is occupied by another living soul. You'll allow that nothing receives infection sooner or retains it longer than blankets, feather beds, and mattresses."

Smollett has many comments to make on bad ventilation and bad air generally. That there was need of a food department in his day is shown by a letter in which he contrasts the simple, wholesome food of his home in the country with the adulterated, sophisticated food of London.

"The good people are not ignorant of the adulteration, but they prefer it to wholesome bread because it is whiter than the meal of corn. The miller or baker is obliged to poison them and their families in order to live by his profession. Of the fish I need say nothing in this hot weather, but that it comes sixty, seventy, four score, and a hundred miles by land carriage. This is not the season for oysters, nevertheless it may not be amiss to mention that the right Colchesters are kept in slime pits occasionally overflowed by the sea, and that the green color so much admired by voluptuaries of this metropolis is occasioned by the vitriolic scum which arises on the surface of the stagnant and stinking water."

The policy of floating oysters was already in vogue, though whiteness rather than greenness is an indication that the oyster has been floated.

"But the milk itself must not pass unanalyzed, the produce of faded cabbage leaves and sour draff, lowered with hot water, frothed with bruised snails, carried through the streets in open pails, exposed to four rinsings, discharged from doors and windows . . . overflowing from mudcarts, spatterings from coach wheels, dirt from trash chucked into it by roguish boys for the joke's sake, the spewing of infants who have slobbered in the tin measure, which is thrown back in that condition among the milk for the benefit of the next customer."

After a recital which touches upon nearly every article of food, Smollett concludes:

"Now all these enormities might be remedied with a very little attention to the article of police, or civil regulation; but the wise patriots of London have taken it into their heads that all regulation is inconsistent with liberty and that every man ought to live in his own way, without restraint."—How to Keep Well, *Dr. W. A. Evans.*

✣

Birth and Death-Rates in 1915.—In the recently established birth registration area of the United States—comprising the six New England states, New York, Pennsylvania, Michigan, Minnesota, and the District of Columbia, with an estimated population of 31,150,000, representing 31 per cent. of the total for the United States—776,304 infants were born alive in 1915, representing a birth-rate of 24.9 per 1,000 of population. For every state in the registration area and for most of the cities there was a substantial excess of births over deaths, but this excess was most pronounced in those localities in which the proportion of foreign population is largest. The mortality rate of infants under 1 year of age averaged 100 per 1,000 births, ranging from 70 in Minnesota to 120 in Rhode Island, and, among places having 25,000 inhabitants or more, from 54 in Brookline and Malden, Mass., to 196 in Shenandoah, Pa. These are among the significant facts presented in a preliminary statement just made public by Director Sam. L. Rogers of the Bureau of the Census, Department of Commerce.

Industrial Hygiene and Sanitation.

Bad Teeth and their Effect on the Laboring Man's Efficiency.—It is a matter of common knowledge that impaired health means impaired efficiency. Very few studies have been carried on, however, which furnish information upon the part which oral prophylaxis bears in the connection. Dr. Carl E. Smith of Akron, Ohio, gives a very instructive account of such a study in the *Jour. Am. Med. Assoc.*, Jan. 13, 1917. Doctor Smith made in the past 16 months 30,000 mouth examinations of American and foreign laborers. He found 96 per cent. in need of dental service. In 30,000 mouths were found 60,000 cavities and 18,000 extractions were necessary. Toothache is a very prolific cause of impaired production. Piece workers often lose from thirty-five cents to one dollar and fifty cents daily from the cause. The remedy lies in the coöperation of the medical profession and in the establishment of industrial dental clinics.

✣

The December Issue of the "American Labor Legislation Review" deals in part with the health insurance problem. Favorable expressions are recorded by many men well known in the ranks of American industry, labor, and medicine. It also contains pertinent extracts dealing with the attitude of British and German trade unionists. The major portion of the *Review* deals with legislation for women in industry and was prepared in response to the continuous demand from all parts of the country for information on this vital topic. The number of females engaged in gainful occupations compared with the total female population 10 years of age and over in the United States is 23.4 per cent. Two charts in the *Review* give a rough graphic indication of the irregularity of employment in New York City. The charts indicate for the vast majority of trades covered a high degree of irregularity. Very helpful are tabulations pertaining to "Legal Limitation of Working Hours for Women in the United States" and "Man's Provisions of Minimum Wage Laws in the United States." These summaries are probably the most up-to-date and complete in existence. A chapter on "Childbirth Protection" deals with legislation necessitated by the ever-increasing number of married women in the industries. In the cotton textile industry (New England and Southern group) approximately 40 per cent. of all women aged 20 or over are married. Figures for 1900 showed that 15.5 per cent. of all women at work were married. Census data for 1910 have not yet been made available. Careful studies have demonstrated positively that married women are driven into commercial employment by economic necessity. A brief bibliography on "Women in Industry" completes the *Review*. The bibliography represents an effort to cite up-to-date and accessible works on various phases of the subject rather than to present an exhaustive list of references.

⁂

Women in Munition Manufacture.—To find out what war orders mean to working girls in this country, representatives of the Russell Sage Foundation went to Bridgeport, Conn., last summer to conduct an investigation. The result of this investigation is described in *The Survey* of Jan. 6, 1917, by Prof. Amy Hewes. The number of women employed during the summer of 1916 was nearly 4,000. Only 100 of the women were living with their own families. Three serious issues have arisen in the case of the women munition workers in connection with the legal rate of wages: (1) Inducement to long hours of labor and night work; (2) Danger from explosion and industrial poisoning; (3) High cost of living and rise in rents. Night work is not popular with working women. A study of occupational diseases connected with the munitions industry is now in progress by the Federal Bureau of Labor Statistics. This does not, however, include wages and hours. It was supposed that Connecticut legislation prohibited night work for women. The labor laws, however, merely forbade work for women after 10 p. m., and fixed no hours in the morning before which they might not be employed. Consequently, women were kept idle from 10 p. m. until midnight, and then set to work again. A test of the law resulted in the decision that the law did not apply to manufacturing but only to mercantile establishments. Following this decision night shifts continued without the two hours' break. At present women work a total of 55 hours per week, the limit allowed by law. Little attention is being paid to the means of protecting workers from the dangers incident to the use of explosives and to the operation of the machinery in the factories. As many as 1,500 men and women are exposed to the danger from fulminate of mercury. Scrupulous personal cleanliness is the only preventive of this form of poisoning, yet according to the report, washing facilities are inadequate. Rents in Bridgeport have risen tremendously. To accommodate the increasing number of girls in the munition plant large buildings of the dormitory type were started. They are not yet ready for occupancy. The high cost of living upsets the high wages. The situation requires legislative remedial measures.

⁂

The High Cost of Living.—The high cost of living presents at present a grave public health problem. Some figures given in the January number of the *Monthly Review of the U. S. Bureau of Labor Statistics* throw a glaring light upon the abnormal conditions prevailing in the United States. Considering prices on November 15 of each year from 1912 to 1916 all of the 27 of the most important articles of food tabulated were higher on November 15, 1916, than on November 15, 1912: Milk 9 per cent. higher, flour 72 per cent. and potatoes 121 per cent. higher. The prices quoted are retail prices. All articles combined were 27 per cent. higher. Another article in the *Review* deals with the increased cost of living in Great Britain. On September 1, 1916, the average prices of commodities of general consumption in Great Britain had increased approximately 65 per cent. over the prices prevailing in July, 1914, just before the outbreak of the war.

⁂

Vocational Training.—The *Review* contains a series of articles on vocational training in the United States, Germany and Great Britain. Germany has no organized movement of vocational guidance. In the past the economic and social position of the children has for the most part settled the general class of employment which they were likely to enter. This attitude has resulted in an overcrowding of certain trades. The pupils are provided with handbooks furnishing information about various occupations. Parents and guardians obtain valuable information from those handbooks. Such books are also prepared on behalf of the board of trades for various cities in England. Individual pamphlets deal with various occupations.

⁂

Tuberculosis in the Transvaal.—An article in the *Review* deals with the miner's phthisis on the Witwatersrand in Transvaal. The article represents a short abstract of the report rendered by a committee appointed by the minister of mines of the union of South Africa on February 26, 1912. The primary cause of the disease is silicosis. In the later stages tuberculosis sets in. The disease was found to fall most heavily upon machine-drill miners, 48 per cent. of this group being affected. The committee states that any broad policy aimed at the prevention of miner's phthisis must include measures to prevent the formation and dissemination of dust as well as the protection of the workmen. The risk of conveyance of tuberculosis from infected persons to healthy persons underground is by no means negligible. The report contains detailed recommendations.

⁂

Industrial Medicine and Surgery.—H. E. Mock, Chicago (*Journal A. M. A.*, Jan. 6, 1917), says the conservation of life by the prevention of disease and accidents among employees, the basic principle underlying all forms of industrial medicine, is the greatest influence for socialization in our country at present, and the company surgeon of today and the future has the opportunity of extending medical science into this vast field of endeavor. Heretofore, owing to ignorance and lack of interest and provision, this field of medicine has been considered narrow. But when a company surgeon realizes that for greater efficiency an employer has the right to demand a healthful, physically and mentally normal working force and the employee is justified in demanding healthful, sanitary working conditions, and that business principles justify both these demands, and when he possesses a sufficient enthusiasm and knowledge to master the details, his value is unlimited. The industry with which the writer is connected has gradually extended its medical staff and equipment from a four-room office with one doctor and two nurses in 1909 to an eighteen-room office with seven doctors, twelve nurses and two dentists in 1916. The doctors spend part of the time every day in the work so that there is always someone in charge of the company office, while many of the very best of the company surgeons devote their whole time to the industries employing them. As a rule, the greatest corporations find they can get better trained surgeons and physicians if they require them to give only a part of their time to the work. The work of the medical staff and the preventive surgery methods are outlined by Mock, who describes the first aid equipment, and mentions especially the universal use of the tincture of iodin introduced by him as the best antiseptic for first aid in injuries. The examination of employees as a preventive measure is also noticed at some length, and the scope of the work described. The industrial visiting nurse has much to do with the investigation of this latter problem, and no plan of medical supervision is complete without her assistance. The industrial dentist is also doing more and more in the promotion of health efficiency, and the company surgeon who takes advantage of his opportunities is destined to better his abilities in medicine and become also a sociologist and economist whose influence extends through the whole community.

⁂

The Goggle Problem in the Chemical Industry.—I. R. de la Terre Bueno of the General Chemical Company discussed this subject at the last meeting of the National Safety Council in Detroit. He points to the difficulty of compelling workmen to wear unbecoming goggles in chemical plants. Men *will* take a chance and don't seem to appreciate the danger to which they are exposed by such neglect. The ideal goggle should afford perfect protection to the eye, should have a large field of vision, should be comfortable, and in addition must not be unsightly.

⁂

Rarity of Tuberculosis in Workers on Lime.—G. Fisac has called attention repeatedly at various national and international congresses to the fact that persons, whose occupation brings them into close contact with lime and plaster, display immunity against tuberculosis. He quotes data which seem to indicate that lungs and bones affected with tuberculosis have an abnormally low lime content. No one has acted as yet on the logical therapeutic conclusions to be drawn from this important observation. The author does not supplement the statements, which he makes in *Siglo Medico* of November 4, 1916, by technical or clinical details.

⁂

New Division of Occupational Diseases.—The Medical Board of the Union Hospital, Borough of the Bronx, New York City, at a recent meeting voted to establish a division of occupational diseases with Dr. Frederic W. Loughran as attending physician in charge. The patients, before their discharge, will be instructed in prophylactic measures such as pertain to their professions. It is the intention to reach the employer whenever possible in order to stimulate an interest in industrial hygiene.

⁂

Further Responsibilities of the Employer.—A rather interesting decision was recently rendered by Deputy Compensation Commissioner W. C. Richards of New York state. The decision was to the effect that employers whose employees are forced to traverse a dangerous area to or from the noon meal are responsible for their safety and are liable to pay compensation in case of injury under the laws.

⁂

Educational Standards in New York.—Under the new law in New York state which went into effect February 1, 1917, all children between the ages of 14 and 15 years must show, in addition to the 130 days of school attendance, that they have completed the eighth grade instead of the sixth grade as heretofore. For children between the ages of 15 and 16 years the sixth-grade limit remains the same as previously.

⁂

New York State Safety Congress.—The December *Bulletin* of the New York State Industrial Commission gives a brief account of the first meeting of the New York State Safety Congress, which took place Dec. 11 to 14 in Syracuse, N. Y. A number of splendid addresses were heard on problems pertaining to industrial safety and the discussion, which followed, was very animated. The delegates in attendance represented the great manufacturing corporations, the trade unions, the civic organizations and the general public of both sexes. In the course of his address Commissioner Lynch gave plenty of thought to the audience by pointing to the following New York state figures for 1916: Number of industrial accidents, 1,500; persons permanently and totally disabled, 120; persons partly and permanently disabled, 6,180; cost of compensation, $11,500,000; daily cost of industrial accidents, $40,000; wage loss compensation, medical cost, administration expenses, $100,000 per day. Eight organizations observing most modern safety ideas reduced accidents from 30 to 62 per cent. One firm reduced hazards and accidents 75 per cent.

⁂

Fire Prevention in Public Schools.—The Fire Commissioner of New York City, Robert Adamson, discusses in a very instructive manner "Safety for Public Schools," in the December issue of *Safety Engineering*. The city appropriated $500,000 for fire prevention changes in the public schools in accordance with recommendations of the fire department. The appropriation was made after a very comprehensive investigation. Definite standards for fire protection and fire prevention in the schools were established. The Commissioner recommends that the Board of Education employ a supervising fire prevention janitor, whose duty it shall be to make constant inspections of the schools.

⁂

Accident Prevention in the West.—What efficient accident prevention did for the Chicago and North Western Railroad in dollars and cents was brought out strikingly by R. C. Richards at the last meeting of the National Safety Council. In the Middle West, the average cost of railroad accidents is about $115 per case. In the six years and three months that the Safety Organization has been in existence on this railway, up to September 1, 1916, with an increase of nearly 450 additional miles of railroad, there were over 547 fewer fatalities and 16,591 fewer injuries. Anyone can figure out the tremendous saving to the railroad brought about by its efficient "Safety First" organization. Some other interesting figures pertaining to "Railroad Accident Prevention" were presented at the same meeting by Marcus A. Dow of the New York Central Lines. During 1915 only one passenger lost his life in a train accident in the railroads of this country, out of 11,000,000 passengers transported. Only one employee was killed in a train accident for each hundred loaded freight cars transported a distance equal to seventeen and one-half times around the world.

⁂

The Pennsylvania Railroad has issued a "Safety Calender" especially designed for young people to teach them the dangers of taking "short cuts" across railroads, playing on the tracks, or using railroad rights of way, bridges and trestles as highways. The calendar is full of snappy, timely instruction.

Plumbism and Bullet Wounds.—We are accustomed to look upon lead poisoning as one of the unfortunate consequences of work in certain hazardous industries. It is rather surprising to know that lead poisoning may follow injury with bullets which become lodged deeply in the tissues. This is of particular significance when one considers the large number of cases in which bullets are not extracted. Such occurrences have been observed in Germany by Lewin, Keister, Denning and Neu. Plumbism may not appear until many years after the injury. Disselhorst as well as Schneider in the *Muenchener medizinische Woehenschrift* of September 26, 1916, express their opinion that deep-seated bullets should not be removed for anatomical reasons. An operation should be seriously considered if lead appears in the urine.

*

Accidents on the Decrease.—The summary of mortality statistics for 1915 issued by the U. S. Bureau of Census bears out strikingly the success of the "Safety First" agitation of the past few years. Here are just a few figures which will illustrate this:

	1913.	*1914.*	*1915.*
Deaths due to accident....	54,011	51,770	51,406
Rate per 100,000 population	85.3	78.5	76.3
Deaths due to railway accidents...............	——	——	6,652
Deaths due to street car accidents.............	——	——	1,555
Deaths due to automobile accidents.............	——	——	3,978
Deaths due to mine accidents................	——	——	2,009
Deaths due to machinery accidents per 100,000....	2.4	2.0	1.9

All of these figures represent improvements over previous years with the exception of deaths from automobile accidents. The increase of these deaths has not been so rapid however as that in the number of machines in use. The statistics pertain to the United States Registration Area exclusively.

*

Incidental to Employment.—Judge Ward has succeeded in obtaining from the state compensation board at Albany an award of $2,600 for Harry L. Markell of Dolgeville, who lost his eye a few weeks ago as the result of an accident at factory No. 2 of the Daniel Green Felt Shoe Company, of which he is superintendent. Mr. Markell's eye accidentally came in contact with the sharp point of a pencil in the hands of a salesman, with whom he was talking on some matters of business, and an injury was inflicted which later made it necessary to remove the eye. —*Hamilton Republican.*

*

"Dyeing and Cleaning," an abstract of an inquiry made by the Bureau of Inspection of the New York State Industrial Commission, appeared in the November issue of the *Bulletin.* The article discusses the processes as such, which are principally of a chemical nature, and the attending health-hazards. Certain recommendations are made for the prevention of fires and explosions. Business is largely employed in such establishment. No known fires or explosions have occurred with this trade during the past year. The inquiry was made by John H. Vogt, Chemical Engineer, in charge of the Division of Industrial Hygiene.

*

Factory Supervision.—The experience of the health department at the Norton Company and the Norton Grinding Company, Worcester, Mass., in regard to the medical supervision of its employees is reported by W. Irving Clark, Jr. (*Journal A. M. A.*, Jan. 6, 1917). The best time to examine any employee, he says, is before he is hired, thus eliminating any man totally unfit for the work. Rejections, however, should be made only when necessary, and the examination cannot be too complete. They arbitrarily reject all applicants over 45 years of age, all men with one eye or serious eye defects, all cases of contagious disease including, of course, tuberculosis, any with more than second degree hernia, cases of uncompensated heart disease, varicose ulcer, fourth and fifth degree flatfoot giving trouble, and marked hypertension. The list of defects not barring from employment includes but few employees carrying them. The average workman, though with numerous slight defects, is perfectly capable. There are, of course, some departments where restrictions must be higher than others, and for these they try to get men as absolutely fit as possible. The candidate is told of his defect and wherever possible is instructed how to get rid of it. Several of their employees have followed these instructions.

They find that the average workman does not object to physical examination, and most of them are pleased to have it made on account of the information it gives them and acquaintance with the doctor, to whom they are going to apply afterward in case of sickness or accident, and the most complete examination does not take more than ten minutes, provided no laboratory tests are required. Periodic examinations tend to keep the man in good condition; and as it is impossible to find men absolutely without defects, it is possible to place men in departments where they run the least risk and are most efficient. An examination each time a man is transferred prevents the possibility of unfit assignments. All men having any sickness or accident apply to the hospital, and are there examined. The number of rejections altogether is very small. All employees who are injured receive treatment at once in case the accident is reported, and the loss of time from injuries has been reduced to the minimum. They had no case of sepsis, though they cannot absolutely say they have excluded all infection. The routine treatment of accidents is to first wash the wound with commercial gasoline, using it like water, and scrubbing with sterile gauze. Following this at once, tincture of iodin, U. S. P., is poured into the wound and over the skin, allowed to dry and a sterile gauze dressing applied. Iodin to be 100 per cent. efficient as an antiseptic must be used within thirty minutes after receipt of the injury. The full power of the hospital for good in these cases has never been completely brought out. During the month of April they treated 474 accidents, but one of which was severe enough to draw compensation. Its effect is to cure so rapidly that its full facilities for after-treatment have not been called on. A very little inducement brings every case, no matter how light, to the shop hospital. The treatment for sickness is prophylactic, not curative. The aim is to diagnose and see that the man gets immediate attention from his family physician or a specialist as indicated. If a man has a temperature of 100.4 he is not allowed to continue or return to work, and a follow-up system is in use for various obvious reasons.

Personal Notes.

At the recent annual meeting of the Society of American Bacteriologists, held at New Haven, Conn., the following officers were elected: President, L. F. Rettger; Vice-President, R. E. Buchanan; Secretary-Treasurer, A. Parker Hitchens; members of the Council, Jean Broadhurst, L. A. Rogers, E. A. Ingham; delegate to A. A. A. S., Philip B. Hadley.

*

It is, indeed, most gratifying to note the recent reappointment of Dr. Oscar M. Dowling as president of the Louisiana State Board of Health. It is not often that the appointment to such a state office arouses such wide-spread publicity as the question of Doctor Dowling's reappointment has, but in this case it was a struggle between the wish of the people for the continuance of efficient health administration and the will of political power. One of the many commendatory editorials appearing in the local papers states, in part, as follows: "With no weapons to combat his powerful political enemies but his splendid record of service and assertive public confidence, Doctor Dowling has won a notable victory. . . . Dr. Dowling's victory is the people's victory, the victory of non-political control of the public health affairs of the state. . . . In every section of Louisiana there is tangible evidence of his efficient stewardship. He has done more than any living man to put Louisiana on the health map of the United States and to bear to its people the profitable knowledge that hygiene and sanitation are conducive to healthfulness. It is gratifying to know that the standards he has set are to remain and that they are not to be fettered by political favoritism."

*

A significant advance in public health administration is demonstrated in the proposed creation of a new city government office for New York City, that of consultant on health and hospitals to the Board of Estimate. If this proposed plan goes through, it will bring Dr. S. S. Goldwater, former commissioner of health of New York City, again into municipal service, for Doctor Goldwater has agreed to occupy this new post without pay for the remainder of the year 1917. New York is, indeed, most fortunate to have a man of such qualifications to be the first occupant of this important post.

✠

Dr. Frankwood E. Williams has resigned his position as chairman of the Massachusetts Advisory Prison Board and executive secretary of the Massachusetts Society for Mental Hygiene, to become associate medical director of the National Committee for Mental Hygiene.

✠

It is announced that Prof. W. Kolle, chief of the Institute for Bacteriology and Hygiene of the University of Berne, has been appointed to succeed Professor Ehrlich in the Institute for Experimental Therapy at Frankfort. Prof. Hans Sachs, formerly assistant to Professor Ehrlich at Frankfort, has been appointed director of the Institute, under Professor Kolle.—*Exchange.*

✠

Dr. Howard A. Streeter of Marblehead, Mass., has been appointed state district health officer of the Berkshire District of Massachusetts. Dr. Stanley H. Osborn, the former encumbent, has resigned to become epidemiologist of the Massachusetts State Department of Health.

✠

We regret to announce the death of Mr. R. B. Dole, chemist in the United States Geological Survey, Washington, D. C., which occurred on January 21, 1917, after a brief illness.

✠

Dr. Charles E. Terry has resigned his position as health officer of the city of Jacksonville, Fla. to devote his time to writing. He is to take charge of the new section the *Delineator* (New York) has recently inaugurated on health. The city of Jacksonville sincerely regrets the loss of Doctor Terry's services, for during the seven years of splendid service as city health officer he gained a nation-wide reputation, championing the many needed reforms, both in public health administration and methods.

✠

The National Association for the Study and Prevention of Tuberculosis announces that its plans are complete for the publication of a monthly journal for physicians and research workers in tuberculosis, to be known as the *American Review of Tuberculosis*. The *Transactions* of the annual meeting of the association will be discontinued and the papers presented at these meetings will be published in the *Review*.

The first issue of the new journal will appear in March, and will contain approximately sixty-four pages of reading matter. It will be of standard magazine size. Dr. Allen K. Krause of Baltimore has been appointed managing editor of the *Review*, and its editorial policy will be determined by an editorial staff of seven members to be appointed by the board of directors of the association.—*Exchange.*

✠

Dr. John S. Billings, after twenty years' service in the New York City Health Department, has resigned his position as deputy commissioner of health and director of the Bureau of Preventable Diseases, to take effect May 1, 1917.

✠

It is announced that Dr. Simon Flexner, director of the laboratories of the Rockefeller Institute for Medical Research, has been elected foreign associate member of the Paris Academy of Medicine.

✠

Dr. Linsly R. Williams, deputy state health commissioner of New York, will act as commissioner of health during the absence of Dr. Hermann M. Biggs in France.

✠

Dr. R. M. Pearce, John Herr Musser Professor of Research Medicine at the University of Pennsylvania, has been appointed to take charge of the survey of the conditions of life among the people of Argentina and Uruguay, recently undertaken by the International Health Board.

✠

Dr. Frederick M. Harris of La Crosse has been appointed director of the second state coöperative laboratory of Wisconsin. The laboratory has been established at Fond du Lac, and the expenses are shared mutually by the State Board of Health and the locality in which it is established.

✠

Dr. Alfred E. Shipley of Brooklyn, N. Y., has been appointed secretary of the New York City Department of Health to succeed E. W.

Sheffer who was retired January 1, after twenty years of service.

*

Dr. Hasbrouck Delamater of Kansas City has been appointed health officer of the city of St. Joseph, Mo.

*

Dr. Philip E. Blackerby has been appointed registrar of vital statistics of the Kentucky State Board of Health to succeed Dr. W. L. Heizer who recently resigned to become secretary of the State Tuberculosis Commission.

*

At the recent annual meeting of the Oregon State Board of Health, Dr. A. C. Selby was elected chairman of the board, and Dr. David N. Roberg was reëlected secretary and state health officer.

*

Dr. Francis E. Harrington of the United State Public Health Service has been granted leave of absence by Surgeon General Blue to take charge of the health work of Jefferson County, Alabama, of which he has been elected full-time health officer. Dr. C. D. Gaston, city health officer of Birmingham, however, will still continue at his post. The unified health system recommended by Surgeon Carroll Fox, of the Service, calls for the expenditure of about $30,000 by the county for its maintenance. One of the most important features of the scheme is the withdrawal of the health supervision of the Birmingham schools from the hands of the Board of Education, and placing it under the control of the county health officer.

*

At a recent meeting of the Arkansas State Board of Health, Dr. J. T. Clegg of Siloam Springs was elected chairman, and Dr. B. A. Fletcher of Augusta was elected vice-president of the board for 1917.

*

Arthur H. Young, who for some years has been supervisor of labor and safety of the Illinois Steel Company, Chicago, took up his new duties as director of the American Museum of Safety, New York City, on January 1, 1917.

*

The American Association of Industrial Physicians and Surgeons offers a prize of $100 for the best thesis on any subject related to industrial medicine and surgery by any undergraduate medical student of the United States. The thesis must not contain more than 5,000 words. All theses must be in the hands of the secretary of the association by May 1, 1917. H. E. Mock, M. D., Secretary, 122 South Michigan Ave., Chicago, Ill.

*

The Association of Military Surgeons of the United States announces the results in the Henry S. Wellcome Prize Competition. Captain Mahlon Ashford, M. C., U. S. A. who wrote on the subject, "The most practicable plan for the organization, training and utilization of the medical officers of the Medical Reserve Corps of the United States Army and Navy, and of the medical officers of the Officers' Reserve Corps of the United States Army, in peace and war," was awarded a gold medal and $300. First Lieut. Henry C. Coe, M. R. C., of New York City, who received the honorable mention for this prize was awarded a life membership in the association. A silver medal and $200 was awarded to Assistant Surgeon-General W. C. Rucker, U. S. P. H. S., whose essay was entitled "The influence of the European War on the transmission of the infections of disease, with special reference to its effect upon disease conditions of the United States." Passed Assistant-Surgeon J. R. Hurley, U. S. P. H. S., received honorable mention for this prize and a life membership in the association. These prizes, which were given by Mr. Henry S. Wellcome, an American living in London, are annually competed for by officers of the Army, Navy, Public Health Service, the National Guard and the Officers' Reserve Corps of both the Army and and the Navy. The essays of the successful contestants will be published at an early date in the *Military Surgeon.*

*

The following persons were elected to membership in the American Public Health Association, January, 1917:

Dorothy Reed Mendenhall, Madison, Wis., Physician and Lecturer on Health, University of Wisconsin.

Laura Leonard Gilman, M. D., Madison, Wis., Assistant Bacteriologist, Wisconsin State Laboratory of Hygiene.

Walter Junkins, Westfield, Mass., Agent, Board of Health.

Paul Nichols, B. S., Malden, Mass.

Edwin F. Voigt, Urbana, Ill., Assistant Bacteriologist.

Ashley B. Morrill, M. D., Chicago, Ill., State Health Officer.

M. J. Mackler, Boston, Mass., Student School for Health Officers.

E. H. Gage, Boston, Mass., Sanitary Engineer.

A. W. Akerley, M. D., Boston, Mass.

John J. McCormick, M. D., Woburn, Mass.

Edward B. Oliver, M. D., Fort William, Ont.

John Collinson, M. D., Havre De Grace, Md., Deputy State Health Officer.

H. B. Neagle, M. D., Dorchester, Mass.

B. S. Beach, M. D., Chicago, Ill., Sanitary Inspector.

Mr. William C. Groeniger, Columbus, Ohio, Director, Division of Plumbing, Ohio State Board of Health.

Elizabeth Ingram Adamson, M. D., Niagara Falls, N. Y.

Martin M. Kloser, B. S., City Board of Health, Shreveport, La., Chemist.

W. H. Coon, M. D., Haverhill, Mass., Harvard Infantile Paralysis Commission.

Mr. C. A. Abele, Mass. Institute of Technology, Cambridge, Mass.

Mr. Norbert M. Buderick, Buffalo, N. Y., Chemist.

Mr. S. T. Powell, Baltimore, Md., Chemist and Bacteriologist, Baltimore County Water & Electric Co.

Ralph M. Eppstein, Ph. C., M. D., Chicago, Ill., School Physician, Tuberculosis.

G. A. Lurie, M. D., Mt. Vernon, Ill., District Health Officer, State Board of Health.

A. George Gigger, M. D., Providence, R. I., Assistant Pathologist, State of Rhode Island.

Emanuel B. Fink, Chicago, Ill., Student of Medicine and Public Health.

Warren E. Forsythe, M. D., State College, Pa., Director of Health Service.

Charles C. Kimball, M. D., Ph. D., Watertown, N. Y., Commissioner of Health.

George R. Taylor, Scranton, Pa., Chemist, Scranton Gas & Water Co.

P. H. Norcross, Atlanta, Ga., Consulting Engineer.

Norman C. MacLeod, M. D., Newport, R. I.

Harry N. Jenks, Burma, India, Sanitary Engineer, Burma Mines, Ltd.

Current Public Health Literature.

AMERICAN.

American Labor Legislation Review, New York.

VI. December.

Attitude of British and German Trade Unionists toward Health Insurance.
Recent American Opinion in Favor of Health Insurance.
Irregularity of Employment in New York City.
Legislation for Women in Industry. 1. Women in American Industry; 2. Hours; 3. Minimum Wages; 4. Health, Comfort, and Safety; 5. Child Protection; 6. Bureaus of Labor, Minimum Wage Commission, etc., Dealing with Labor Legislation Affecting Women; 7. Short Bibliography on Women in Industry.

American Medicine, Burlington, Vt.

XI. December.

Etiology of Rickets. A. M. Gossage.
Principles Involved in Notification of Tuberculosis. P. H. Bryce.
The Poliomyelitis Epidemic—A Review of the Field Work Performed by the Health Department. J. R. Graham.
The Professional Secret and Venereal Diseases. A. O'Malley.
Are Venereal Diseases Contagious? H. Crutcher.

American City, New York.

XVI. January.

Making Pension Systems an Asset. Lawson Purdy.
Letters on the Problem of Smoke Abatement.
A Unique Industrial Center. H. F. Chapin.
The Nature of Color in Water. Thorndike Saville.
The Problem of Additional Sources of City Revenue. F. W. Powell.
Public Schools as Municipal Neighborhood Recreation Centers. H. O. Berg.
Civic Organizations and Child Labor. Helen C. Dwight.
Keeping of Records at Sewage Disposal Plants. C. G. Wigley.

American Journal of Clinical Medicine, Chicago.

24. January.

Relation of Sore Throat to Intestinal Infection. D. H. Stewart.
A Symposium on Long Life. J. M. French.
A New Theory of the Etiology of Epilepsy L. V. Dawson.
Therapeutic Indications Suggested by Sputum Findings G. R. Williams.

Boston Medical and Surgical Journal.

CLXXVI. January 4.

The Beneficial Results of Prenatal Work. M. M. Davis.

Results Obtained by the Class Method of Treatment of Tuberculosis during a Period of Ten Years. J. H. Pratt.

Report of a Dietary Study of St. Paul's School, Concord, N. H. F. C. Gephart.

Remarks on Health Insurance. C. E. Mongan.

January 11.

The Public Health Aspects of Leprosy. G. W. McCoy.

The Harvard Infantile Paralysis Commission and its Work in Massachusetts. R. W. Lovett.

January 18.

The Duty of the Health Department in the Alcohol Question. Haven Emerson.

Dodge Idea, Mishawaka, Ind.

33. January.

Sojourn of the Women in Industry. Marie L. Obenhauer.

Using the "Should Be" in Making the Factory Safe. J. M. Wilson.

Earning and Saving Through Employee's Benefit Associations. W. L. Chandler.

Factory, New York.

XVIII. January.

Getting More Out of the Factory Laboratory. L. C. Wilson.

Journal of the American Medical Association, Chicago.

LXVIII. January 6.

Industrial Medicine and Surgery: The New Specialty. H. E. Mock.

Medical Supervision of Factory Employees: Result of Five Years' Experience. W. I. Clark, Jr.

The Production of Antipoliomyelitic Serum. J. W. Nuzum.

General Health Conditions in Belgium after Two Years' Relief Work by Commission for Relief in Belgium. W. P. Lucas.

Aural Typhoid Carriers. A. B. Bennett.

January 13.

Summary of Pennsylvania State Work in Poliomyelitis. S. G. Dixon.

Further Observations on the Connellan-King Diplococcus Throat Infections. J. J. King.

Medical Supervision of Street Railway Employees. C. H. Lemon.

Bad Teeth and Their Effect of the Laboring Man's Efficiency. C. E. Smith.

The Sanitation of Public Markets. D. B. Armstrong.

Filariasis: Report of Two Cases in the District of Columbia, and an Analysis of the Cases Reported for Eastern North America. M. W. Lyon.

January 20.

Vaccin Therapy: Its Possibilities and Limitations. D. J. Davis.

Journal of Bacteriology, Baltimore.

II. January.

The Colorimetric Determination of Hydrogen Ion Concentration and Its Applications in Bacteriology. I. W. M. Clark and H. A. Lubs

Soil Flora Studies. I. H. J. Conn.

The Influence of Milk and Carbohydrate Feeding on the Character of the Intestinal Flora. IV. Diet Versus Bacterial Implantation. T. G. Hull and L. F. Rettger.

Coccidia in Subepitheial Infections of the Intestines of Birds. P. B. Bradley.

A Bacterial Disease of the Wragg Cherry. Preliminary Note. W. G. Sackett.

Journal of Infectious Diseases, Chicago.

XIX. December.

The Necessity of a Standard Blood-agar Plate for the Determination of Hemolysis by Streptococci. W. C. Becker.

Acid-production and Other Characters of Bacillus-coli-like Bacteria from Feces and Sewage. Max Levine.

The Etiology of Typhus Exanthematious in Mexico. Olitsky, Denser and Husk.

XX. January.

Comparison of Methods for Disinfecting Swimming Pools. W. A. Manheimer.

Studies of the Beta-hemolytic Streptococcus. W. G. Smillie

A Small Contact Epidemic of Typhoid Fever. M. F. Boyd.

The Etiology of Acute Epidemic Poliomyelitis. George Mathers.

Journal of Laboratory and Clinical Medicine, St. Louis.

II. December.

The Detection of Semen. V. C. Vaughan.

Trypsin Broth—An Ideal Medium for Making Blood Cultures. A Preliminary Report. R. G. Owen, F. A. Martin, and W. G. Pitts.

A Standard Method for Making Uniform Colloidal Gold Solution. W. K. Trimble.

The Preservation of Erythrocytes for the Wassermann Reaction. S. P. Reinmann.

A Simplified Complement-Fixation Test. N. E. Williamson.

A Modification of Gerhardt's Test for Diacetic Acid in Urine. H. P. Barret.

Prevention of Frothing in Aëration Methods. A. B. Dennison.

The First Year of the Michigan Tuberculosis Survey. V. C. Vaughan. Editorial.

The Choice of Ruling in a Blood Counting Chamber. R. S. Morris. Editorial.

Vitalism and the New Physiology. J. J. R. Macleod. Editorial.

Spirochetes in Healed Syphilis. P. G. Woolley.

Journal of Outdoor Life, New York.

XIV. January.

Community Control of Tuberculosis. Haven Emerson.

On the Just and Unjust Alike. Arnold Mulder.

Another Step in the Anti-Tuberculosis Campaign L. G. Vogel.

The Open Air School of the Sanatorium. Hester Pherson.

What Do You Owe to the Anti-Tuberculosis Movement. J. W. Flinn.

Health Campaigns in Pekin and Tientsin. W. W. Peter.

Industrial Management, New York.

LII. January.

Intolerable Burden and Cost of Needless and Senseless Labor Strikes.

The New Profession of Handling Men. Meyer Bloomfield.

Choosing Employees by Test. W. F. Kemble.

Measuring the Workman's Physical Fitness for His Job. M. W. Alexander.

Working Explosively: A Protest against Mechanistic Efficiency. W. H. Smythe.

Working Efficiently: An Argument for the Introduction of Efficient Methods. "By an Efficiency Expert."

The Taylor System in the Franklin Shops. G. D. Babcock.

Medical Times, New York.

XLV. January.

Medicine in Special Relation to Therapeutics in 1916. R. W. Wilcox.

Dermatology and Syphilis in 1916. W. J. Heinmann and Max Sheer.

A Review of the Alcoholic Problem in 1916. T. D. Crothers.

Medical Record, New York.

91. January 6.

Is There Any Relation Between Tuberculosis, Mental Disease and Mental Deficiency. S. A. Knopf.
New Research Work relating to the Alcoholic Question. T. D. Crothers.

January 13.

The Cancer Problem and the World War. W. S. Brainbridge.
Activation of the Organism of Poliomyelitis upon Solid Media, and a Consideration of Its Behavior Under Varying Conditions. Horace Greeley.

January 20.

Explosives—Industry Poisons. W. G. Hudson.
Cost of Treating Pulmonary Tuberculosis, with Especial Reference to Wage Earners and Communities. J. F. Russell.

Modern Hospital, St. Louis.

VIII. January.

A Complete Suburban Hospital—The Muhlenberg. F. J. Hubbard.
Successful Medical Treatment in Chronic Alcoholism. C. B. Townes.
Some Facts and Fallacies of Sterilization. A. W. Clark.
U. S. Naval Hospital of the Island of Guam. L. W. Johnson.
The Cost of Operating a Motor Ambulance. W. Fawcett.
The Story of a New England County Hospital. J. M. French.
The Small Community Hospital—The Equipment (Paper VI). J. A. Hornsby.

New York Medical Journal.

CV. January 6.

Pathology of Poliomyelitis and Its Relation to the Virus. G. E. Price.

January 13.

Physical Examination of Prisoners on Admission to Prison. F. L. Heacox.
Food and Efficiency. Practical Dietetics (Concluded). Martha Tracy.

January 20.

Medico-Educational Problems in the Treatment of Atypical Children. C. Hudson-Makuen.
Fatal Streptococcemia in an Epileptic. H. A. Knox.

New York State Journal of Medicine, New York.

17. January.

The Proper and Efficient Disinfection of a House. G. W. Goler.
Welfare Work of the Metropolitan Life Insurance Company for Their Employees. Lee K. Frankel.

New Orleans Medical and Surgical Journal.

69. January.

Bacterial Cultures of Human Spleens. A. W. Sellards.
Etiology of Rocky Mountain Spotted Fever. S. B. Wolbach.

Proceedings of the Conference of State and Provinicial Board of Health of North America 1916.

Secretary, Dr. E. R. Kelley, Mass. State Health Department, Boston.

Committee Reports:
- Conservation of Vision. G. T. Swartz, Chmn.
- Pellagra. J. A. Hayne, Chmn.
- Relation of Federal and State Authorities in Sanitary Regulation of Common Carriers. E. R. Kelly, Chmn.
- Model State, District, and County Health Laws. J. H. Sumner, Chmn.
- Course of Study in Sanitation for Women's Clubs. S. J. Crumbine, Chmn.
- Recent Advances in Sanitary Laws, Organization, and Practices. J. L. Burkhart, Chmn.
- Postal Aid to State Health Work. J. S. Fulton, Chmn.

Addresses and Discussions.
- Fundamental Distinctions Between Federal and State Health Policies. Oscar Dowling.
- Fundamental Distinctions Between State and Local, County, and City Health Policies. J. N. Hurty.
- Extent and Method of State Control in County Health Work. W. S. Rankin.
- Salvarsan as a Public Health Agency. A. J. McLaughlin.

Symposium on Control of Communicable Diseases:
- Best Method of Disinfection after Tuberculosis, Whooping-Cough, Typhoid Fever, Scarlet Fever, Measles, Diphtheria, and Smallpox. A. J. Chesley.
- Minimum Quarantine and Degree of Isolation in Measles, Whooping-cough, Diphtheria, Scarlet Fever, Smallpox, and Mumps. C. F. Dalton.
- What Can Be Done Through the Schools in the Prevention of the Communicable Diseases. L. R. Williams.
- Difference in Method of Control of Communicable Diseases in Urban and Rural Communities. J. S. Fulton.

President's Address: Some Remarks on the Present Status of Public Health Work. E. G. Williams.

Public Health Nurse Quarterly, Baltimore.

IX. January.

Organized Neighborhood Nursing. I. Blanche Swainhardt.
Organized Neighborhood Nursing. II. Isabel W. Lowman.
The Inter-Dependence of the Nurse and the Social Worker. Margaret F. Byington.
The Limitations of Public Health Nursing. Edna L. Foley.
Summary of Educational Requirements in Nursing Associations and State Laws. Helen L. Redfern.
A Series of Lectures on Public Health, for Student Nurses. Cecilia A. Evans.
Infantile Paralysis. Elizabeth Gregg.
A Series of Talks on Public Health Nursing. Mary Beard.
The Public Health Nurse and Child Labor. Helen C. Dwight.
The Visiting Nurse in Industrial Welfare Work. Florence S. Wright.
An Ideal Made Real in Toledo. Olive A. Colton.
Giving a Vision. Lucy M. Bushey.
A Survey of Knott County Schools, Kentucky. Rose M. Ehrenfeld.

Social Hygiene, Baltimore.

III. January.

The Bureau of Social Hygiene. J. D. Greene.
Clinics for Venereal Diseases. Why We Need Them; How to Develop Them. W. F. Snow.
A Health Exhibit for Men. F. J. Osborne.
The Matter and Method of Social Hygiene Legislation. T. N. Pfeiffer.
Prostitution and Alcohol. Walter Clarke.
Social Hygiene Activities of the Maine Medical Association. F. N. Whittier.
Treatment of Venereal Disease in the General Hospitals of New York State Outside of New York City. J. J. Weber.
The Venereal Peril. I. W. Brewer.

Survey, New York.

XXXVII. January 6.

Shorter Work Day. Dorothy K. Brown.
Women as Munition Makers. Amy Herves.
The Medical Renaissance in China. Wu Tien Teh.
Begging Bread for Poland.

January 13.

Turning Off the Spigot. I. What Makes Men Stop Drinking? Elizabeth Tillon.

When Wise Men Disagree. J. R. Commons.
In the Service of the State. J. H. Finley.
Children vs. A Great Machine. Eleanor H. Johnson.
A Mental Examination in Open Court. June E. Downey.

January 20.

The New Public Health. II. The Program of a State Board of Health. Alice Hamilton and Gertrude Seymour.

Southern Medical Journal, Birmingham.

X. January.

The Utilization of the Dispensary in Medical Teaching. W. S. Elkin.
The Infectiousness of Tuberculosis. T. D. Coleman.
Report of Committee on Uniform Laws for Southern States. O. M. Dowling.
A Statistical Study of Intestinal Helminthiasis. D. G. Willets.
School Inspection by County Health Officer and How to Secure a Correction for Defects. D. E. Sevier.

Texas State Journal of Medicine, Ft. Worth.

XII. January.

The Fumigation of Ships. R. L. Wilson.
Defects in Sight and Hearing that Retard Mental Development. E. R. Cary.
The Physician's Duties and His Relation to the Community. J. B. McKnight.
Publicity in Public Health Work. W. J. Thomson.

United States Public Health Reports, Washington, D. C.

XXXII. January 5.

The New U. S. Life Tables. Their Purpose and What They Show. J. W. Glover.

January 12.

Public Health Administration in St. Paul, Minn. I. G B. Young.

January 19.

Public Health Administration in St. Paul, Minn. II. G. B. Young.

GREAT BRITAIN.

Journal of the Royal Sanitary Institute, London.

XXXVII. December.

Prize Essay on Maternity and Child Welfare, 1916. Isabel Macdonald and Kate C. Atherton.
Maternity and Child Welfare. Harold Kerr.
A National Scheme of Physical Education. R. T. McKensie.
A New Type of Trickling Filter. G. G. Nasmith.

Journal of State Medicine, London.

XXIV. December.

The Harben Lectures, 1916, by Alex. Cruikshank Houston. II. River Thames. 1. Its Relation to Pathogenic Bacteria; 2. Its Resistance to Filtration, and the Microscopic Appearances of the Suspended Matters; 3. Vitability of Pathogenic Bacteria under Conditions of Storage; 4. Chemical and Bacteriological Changes and Conditions of Storage.
The Control of Rat Plague. W. Wright.

Medical Officer, London.

XIV. December 23.

Proposed Municipalization of Milk Supply.
Etiological Hypotheses Regarding Typhoid Fever. W. H. Hamer.

December 30.

Etiological Hypotheses Regarding Typhoid Fever (concluded). W. H. Hamer.

January 6.

Washing Facilities and Baths.
Causes of Invalidity.
Social Service Work in Hospitals and Clinics as an Aid to the Control of Syphilis and Gonorrhea. Norah March.

PUBLICATIONS RECEIVED.

The Prevention of Disease. By Kenelm Winslow, M. D., 1916. W. B. Saunders Co. Pp. 337. Cloth, $1.75 net.

Public Health Nursing. By Mary S. Gardner, R. N., 1916. The MacMillan Co. Pp. 364. Price, $1.75.

Personal Hygiene and Physical Training for Women. By Anna M. Galbraith, M. D., 1916. W. B. Saunders Co. Pp. 373. Cloth, $2.25 net.

Food Study. By Mabel Thacher Wellman, 1917. Little, Brown & Co. Pp. 312. Price, $1.50.

Housing Problems in America. Proceedings of the National Housing Association. V. 1916.

Proceedings of the Conference of State and Provincial Boards of Health of North America, 1916. E. R. Kelley, M. D., Boston, Mass., Sec.

Proceedings of the Tenth Annual Meeting of the Association of Life Insurance Presidents, 1916.

Annual Report of the Department of Health of the City of New York for the Year 1915.

19th Annual Report of the Bureau of Labor and Industrial Statistics of Virginia, 1916.

1915 Annual Report of the Industrial Commission of the Department of Labor of the State of New York.

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A PROGRAM OF PUBLIC HEALTH FOR CITIES.

Assistant Surgeon General W. C. Rucker, M. D., M. S., Gr. P. H.,
United States Public Health Service, Washington, D. C.

Read before the Public Health Administration Section of the American Public Health Association, Cincinnati, Ohio, October 24, 1916.

CONSIDERED in its broadest sense, the ultimate reason for cities is public health. Every other reason for which mankind collects itself into more or less permanent aggregations is subsidiary to the basic idea of community protection and betterment of every sort. This protection is external, against the outside world, and internal, each individual against the entire collection of individuals. Since every action which produces a betterment of the conditions under which the community lives and works gives a definite reaction in increased health, it is at once seen that a public health program for cities is in reality nothing more or less than a complete plan for communal existence.

The collection of individuals into communities without the direct interposition of health protective measures is possible up to the biological limit of individuals per acre. The moment that concentration is increased beyond this point there is increased opportunity for promiscuity with a coincident intercommunication of disease and reduction of the acreage ratio below the biological limit. Therefore, in order that mankind may dwell in a concentration greater than the biological limit, it is necessary that artificial safeguards be thrown about him.

These safeguards take the form of those general community measures which must be exercised by the entire machinery of city government and those special measures which are exercised by health departments. Of the two, those exercised by the community machinery as a whole are of far greater importance. Health departments, for the most part, operate in end results. Under the present system disease must appear before it can be attacked, the municipal policy being one of eradication rather than prevention. This is to be expected in cities which maintain fire departments for the purpose of extinguishing fires rather than to prevent them, and under this system it would be more logical to call the health department the disease department. Until there is a basic change, health departments can do little more than scratch the surface of disease prevention because their authority deals with the actualities rather than with the potentialities of disease.

The entire community machinery by coöperation, on the other hand, possesses power to strike health hazards at their very root, to throttle at their inception those elements of municipal life which are the great producers of sickness, misery, inefficiency and premature death. Furthermore, it is possible in this way to create and follow out a definite community policy of which health shall be a basic part. Heretofore, the protection of health has been considered as a function residing wholly in the health department as though health did not as vitally concern the other departments of the city government. The public health program of the future embraces the coördination of the entire municipal machinery and the coöperation of the whole community.

Unfortunately, health has been considered in the past solely as a medical problem and the pendulum has been enthusiastically swung so far that health is almost regarded as an artificial state to be achieved and maintained solely through the interposition of medical safeguards. With entire consistence the health wardenship of cities has been committed solely to physicians, those who by training have been taught to consider the pathological in human life, the symptomatology and evidences of disease rather than the great, basic, underlying, essential factors which enter into and are the vital part in the creation, spread, and perpetuation of sickness. Expert knowledge of disease is absolutely necessary for the work of health departments, but cannot be the foundation of a broad municipal health policy. Public health is something more than a mere absence of disease. It is the physiological functionation of the community.

From the foregoing it may be deduced that the first and most important thing in a public health program for cities is a definite municipal public health policy which shall embrace every department of the city government. In order that such a plan may be put into operation it is necessary that there be a central focus which shall receive impulses from all of the departments and radiate them to the points where they will react with the greatest benefit to the public health. This is in effect the creation of public health centre in the city's brain. If we are to expect active interdepartmental coöperation it is necessary that all of the departments shall be in close touch and that there shall be a medium whereby they can communicate. More than this, if we are to expect the mass of the citizenship to join in this coöperation, there must be some means whereby this shall be achieved.

The keyword in this public health policy is coöperation, coöperation having as its basis the full recognition of the fact that in its last analysis the health problem is an economic problem and as such cannot be solved without careful consideration of the economics of the community. There has been a great deal said about the purchasability of health. This pleasing catchword has generally been interpreted as meaning that if the general public would give sufficient funds to the health department it would receive health in exchange. Used in this way, the phrase is incorrect because physical health can no more be purchased than spiritual health, and in both, coöperation is a prerequisite to salvation. If we consider that health is purchasable by the full pay envelope whose contents are outlaid for proper food, clothing, housing, and all that goes with them, then indeed is public health purchasable, but this requires the coöperation of the city and its citizens, the aim of this coöperation being the prevention of the shrinkage in the purchasing power of the contents of the pay envelope.

The heart of the program lies in the central coöperating focus. The details of the program will adjust themselves without friction if this point be well determined. This comprehends both the office and the man. The office must be removed from politics; its compensation should be sufficient to render its holder above influence; its tenure should be indefinite; it should have both executive and advisory functions, its advisory functions touching every part of the judicial, legislative and executive functions of the city government. In this way the courts, in making decisions fixing precedents having a bearing upon health, can and should receive expert advice. No legislation should be enacted by the city council without the advice of its health coördinating focus. To it the executive branches of the city government should refer all plans and matters of policy in order that all may be integrated for health. The direct and indirect authority vested in this office is great and far-reaching.

The man to fill this office must be many-sided and he must be able to view health with a broad angle vision, realizing that his duties are not only to keep an entire municipality from being sick, but what is of infinitely greater importance, to keep the body politic in such a condition that its functionation is at the highest degree of physiological efficiency. He must be able to visualize the fact that the least common denominator of health is the purchasing power of a day's labor. His type of mind should be that which characterizes the presidents of the great universities, a combination of catholicity of mental development with creative imagination.

This officer should be the health commissioner; the central coöperating focus should be the health department. Not the health commissioner as we know him now; not the health department as it exists today; but a health department enlarged and expanded in power to such an extent that it can and should be able to reach out and touch the every activity of the city government and harmonize the whole for the increase of health. Health departments nowadays err in one of two directions; either they undertake to absorb and control executive functions which are not properly theirs, for example, plumbing inspection, garbage destruction and the like, or they try to limit their activities to such a narrow field that they confine their radius of action to the actualities of disease. The president of a great university does not and should not undertake the teaching of the technicalities of Greek, but he should be able to mold it into the curriculum so as to create healthy-minded education. In the same way, the health commissioner need not and should not be responsible for the operation of water filtration plants but he should be able to assemble them into the city's health machinery.

Since concentration is inversely as the transportation facilities, the health department should be the first to be consulted in any plans for the increase of rapid transit. All of the problems connected with streets, with housing, industrial conditions, playgrounds, parks, schools, all of these bear an intimate relation to health and as such should come within the purview of the health commissioner. The police, now almost solely occupied in the prevention of crime and the maintenance of peace, should be a powerful agency for health. In fact, there is no branch of the city government which cannot and should not be coördinated into the health program.

In a fifteen-minute paper it is impossible to even mention the multiplicity of details which must enter into the carrying out of a public health program for cities. More than this, it is not desirable even if time sufficed. The extent to which the influence of a given agency shall reach is directly dependent upon the mental caliber of its directing head, in other words, upon the fundamental idea from which springs the entire train of thought and all the ramifications thereof. The essential element in a public health program for cities is a definite public health policy which shall bring the health agency into close touch with every activity of communal existence. Not a policy which endeavors alone to prevent those diseases which are caused by vegetable and animal parasites, but one which aims at the control of that greater body of destructive agencies, human parasites. Not a policy which tries to control the insanitary tenement yet leaves out of consideration the cupidity which fixes its rent, but a public health policy which shall embrace the entire political economy of disease, a policy which shall be as broad and far reaching as human nature, since after all, human nature is the groundwork from which arises the fabric of the public health.

DISCUSSION.

Dr. J. N. Hurty, *of Indianapolis, Ind.:* Mr. Chairman and Gentlemen: I know you will all agree that we have listened to a very broad and comprehensive presentation of this subject. It has been treated by principle, generally touching upon the detail a little later. I do not know that a municipal organization is solely and entirely for the public health, but I do think that it is solely and entirely for justice. Justice is at the bottom of all things. If justice is accorded, then all other good things will follow. Lieber, in his "Political Methods"—and I am no lawyer, but I understand it is a very great and authoritative work—says that the sole object of government is justice. Other writers say that the sole object of government is justice and order, but he says that justice includes order and includes all the other features and characters that we care to incorporate into government. Then of course public health is included. Under the head of justice comes even the building of streets and the building of sewers and all of the activities that one can think of, as order, fire, health, etc. Now there is one thing above all else that we do not want to introduce into public health affairs in conjunction with justice, and that is business. We hear everywhere "Let us have a business administration," "Let us do this in a business way." I am fully convinced that we do not want a particle of business about government, not a particle, because business is for profit and government is for justice and the minute you introduce business into government you introduce profit and there is your corruption, and as long as we have that fundamental idea that business covers and includes all of the economies, we will insist upon business and then we will have this horrible corruption which exists in every municipality of the United States. You know corruption is the disgrace of America, and I do believe, it largely, if not entirely, comes out of the idea that we want to do things in a business way, that is, for profit. We do not build sewers for profit; we build them economically and honestly, or should; we build them for a public utility. Justice to the people demands it. Individuals cannot build sewers, therefore the community must do it and it is justice to the community, a very broad view, without question. Of course the organization of a public health department has much to do with the general problem. That is necessarily so, and Doctor Rucker called attention to the fact that at the present time we are dealing with an end product; that is what they say in regard to insanity; for insanity is an end product. We do not take hold of it until the person is insane; then we build palaces in parks to take care of the poor who generally get there by dissipation and incontinence, sexual incontinence, syphilis, etc. We deal with an end product. If we are to have the right kind of health organization, we must deal with the causes of things, not an end product; therefore I would say that hospitals ought not to be under the charge of health departments at all, it ruins the health departments. Their great work is to take hold of the causes of things. If we are going to do anything with insanity, it is not the idea of public health science to build asylums; that belongs to another branch; we have to do it, have to take care of them; there is no doubt, but again I say public health removes the causes of the thing; we have got to fight syphilis, we have got to fight alcohol and all manner of self-indulgences and false ambitions, and we also must fight the degenerative causes of heredity.

Dr. C. St. Clair Drake, *of Springfield, Ill:* There is no question as to the great benefits which would come to the community if the health department and the health commissioner could assume the parts in municipal affairs suggested for them in Doctor Rucker's program. There is hardly a phase of government which has not its public health angle and, if every move of the municipal machinery could be reviewed by the many-sided health commissioner of "catholicity of mental development and creative imagination," possibilities of health promotion would be brought to light which are not dreamed of today. A great deal could unquestionably be accomplished if the health department were permitted to pass upon each step in public work to determine its sanitary soundness, as the law department now passes upon public acts to determine their legal soundness.

I do not want to give the impression that I regard Doctor Rucker's program as over-idealistic. The rapid strides of public health and the increasing recognition of sanitation in governmental affairs, places the realization of the program well within the range of probability. And yet, I think we all realize that such a program would require a very unusual and very radical readjustment of municipal affairs.

In most American cities—far from being the ruling power—the health department is regarded by the administration and by the people as being one of minor importance. As a rule the water department, the department of sewage disposal and garbage disposal, the department of buildings and such departments as streets and alleys are frequently looked upon as being infinitely more important. Although these departments have a very definite public health side—some of them having the conservation of health as the only justification for their existence—the health department is given no voice whatsoever in their conduct and to be heard in the affairs of these departments, the health commissioner must excuse his opinions on the ground that there is an unusual prevalence of disease or some other unusual health condition.

To transport the health department of the average city to the exalted place suggested for it by Doctor Rucker would seem impossible were it not for the progress which has been made in some communities within the past few years. To accomplish this great transformation will require added years of painstaking education of the people as to the real importance of health conservation in the scheme of community life.

The suggestion made by Doctor Rucker that such executive functions as plumbing inspection and garbage disposal be removed from the province of the health department, is quite necessary to the fulfillment of the program. A health department conducting bureaus of definite public work necessarily finds itself in a position of competition with other departments performing similar functions. So long as the health department is engaged in the practical mechanical operation of such public affairs as garbage disposal, it cannot expect to attain unquestioned advisory influence over other departments. A spirit of rivalry is almost inevitable between departments engaged in any way in extensive operative work and requiring large appropriations for such purposes.

The assumption by the health department of certain definite executive functions—such as those cited by Doctor Rucker—naturally leads to the admission that these are the only departments of municipal affairs that have a special public health importance and the other departments are disposed to operate quite independently and to rather resent the supervision or even advisory attitude of the health commissioner or the health department.

We must all agree with Doctor Rucker that in the past public health has been considered as too strictly a medical matter or a physician's problem. We have all come to recognize that efficient health wardenship requires something more than knowledge of the diagnosis and treatment of disease.

The recognition of any new idea almost invariably causes the pendulum of opinion to swing too far and we are now confronted by lay enthusiasts who define the idea that medical training is not at all essential for the health officer and even go so far as to intimate that a medical education is prejudicial rather than otherwise.

Those of us to whom public health administration is no longer a novelty will agree with Doctor Rucker that expert knowledge of disease is absolutely necessary for the work of the health department and that a thorough medical education is the logical foundation upon which must be built the broad qualifications of a competent health officer.

While, as Doctor Rucker says, the time limit on his address permits him to touch only the high spots in a community health program, it seems to me that it would have been well to suggest that a careful study of the individual municipality, in the form of a sanitary or health survey, should precede even the creation of the health department. The sanitary and health requirements of individual communities vary markedly. In one community a certain class of health problems must be given a degree of consideration to which they would not be entitled in another community existing under different conditions. While the health department may be created on certain general lines and according to a certain general plan, the efficiency of the department will be materially increased if it is cut to measure for the individual city, rather than being taken from the shelf ready to wear.

We are all of us speaking today in very broad terms without time for the consideration of detail and I think that we can all subscribe to the general health plan which contemplates the thoroughly competent health commissioner, supported by his organization of experts, freed from the responsibility of unnecessary executive functions and devoting himself in an advisory capacity to all of the departments of municipal government in any way touching directly or indirectly upon the public health. And I believe that we can also subscribe as an addition to that plan, a thoroughgoing inventory of the municipality preparatory to the organization of the health department and preparatory to the outlining of the program for the department's activities.

Dr. C. J. Hastings, *of Toronto:* Mr. Chairman and Gentlemen: I agree and I do not agree with practically all that has been said. I want to congratulate Doctor Rucker, in the first place, on his paper; I do not think it is any too altruistic; I like to see the man who aims high, because the higher you aim the higher you are going to hit. Now we hear, year after year, the expression, "Well, they are not prepared for this yet," and we hear also complaints about our governments, both federal, local and municipal, and our government authorities for not giving us necessary legislation and not backing us up. Are we not too fond of blaming others? Let us place the blame where it belongs. It belongs, gentlemen, with us; we are the educators. These men are there to give the people what they want and what they demand, and they are only too glad to give it, but we must create a demand and an intelligence in the public on public health matters that will cause them to demand a high efficiency of public health administration, and then we will get it. In regard to the education and fitness for the position of administrator of public health, I do not think we can too strongly emphasize the fact that a medical degree of a high standard is an essential prerequisite for that position. I would go further than that, and I think that a man, in order to administer public health work efficiently, should have at least ten years' practice in medicine. Then he is in a position to know what the public want; what the public require. I was glad to hear what Doctor Rucker had to say in regard to physical fitness. Many of us have, I hope, long since swept aside such duties as plumbing inspection and garbage disposal and collection (such work as that has nothing to do with the department of health), and also sewage disposal and water purification. The expense in the construction of these is purely an engineering job, but it is up to the department of health to determine the efficiency of these and demand that that efficiency is reached, and we have got to see, also, that we are not burdened by having this charged up to the public health administration. Doctor Hurty spoke in regard to hospitals and said that the department of public health should not have anything to do with hospitals. I think there is an exception to that—the hospitals for communicable diseases, inasmuch as the quarantining and hospitalizing of communicable diseases very materially aids in our controlling these diseases. Therefore, it is essential, I feel, that hospitals for communicable diseases should be under the control of the department of health. However, after we have controlled communicable diseases, we have only done a fractional part of the public health administration. There are many diseases preventable and postponable that are not communicable, and these are as essentially our duties as the control of the communicable diseases. We are not only here to prolong and save human life, but to obtain the highest degree of efficiency while life lasts, and in order to do that, we have got to get way back to the origin ,the social problem in the home. We only too often find that, when we get back into the home from which we have taken a person suffering from some disease, to a hospital, there is a social problem there that has to be dealt with—that the man is probably out of work and that the mother and wife has to become the breadwinner, and thereby there is a double injustice dealt to that family: the revenue of the home is cut in two and those little children are deprived of the care of that mother in their tender years when they most require it. Therefore, we have to see that it is possible for those people to live in a sanitary condition; we have to see that the revenue of that home is such as to enable those people to be properly nourished and housed, and until we do that and solve these social problems; until we see, as Doctor Rucker pointed out, that the owner of the tenement is not exacting an undue rent, that he is not filling his coffers with blood money, that is essentially a part of our duties, that is what I mean by the social problems of public health.

Dr. E. C. Levy, *of Richmond:* Doctor Rucker's paper is an unusual one. He has put before us an ideal, and I imagine that he himself does not feel that this ideal will be fully attained —certainly not in the life of even the youngest here present. But it is always a fine thing to have ideals, to aim high, even though we lose our hatchet.

In working to that ideal, there are many things we should bear in mind. If the health officer of a municipality is to be a man so many-sided as Doctor Rucker has described, it seems to me that we are going to encounter certain difficulties. As soon as a man is related, in the nature of his service, to so many and such varied activities, we can certainly not expect him to be an expert in all those activities. It therefore would seem, after all, that the end to which Doctor Rucker is working is that of having a city manager and of having that city manager take first into account the health aspect of all problems in the community. For a man to be as broad as all this would mean that he could be scarcely more than an expert executive, who would have to get expert opinions from those under him in each of these various activities. But in this case he would not really be a health officer at all. This would appear to me to be the chief difficulty of Doctor Rucker's program. However, as Doctor Rucker and others will present the working details, it will be interesting to see just how the special difficulty to which I have referred is to be handled. I have to confess that Doctor Rucker had a few sentences in his paper which I could not quite understand, myself; therefore I hope I am puzzling him a bit.

There is no question but that every activity of a community and of every individual in every community has a health aspect, but in remembering this fact, we must also remember that health, while the most important thing, is not the only thing and that we cannot spend all our money for it. The idea of correlating the work of all departments and of coming to the health officer and getting from him advice in connection with each of them is a thing to which we may all work, though we will never, I am afraid, live to see fully realized all that Doctor Rucker has put before us.

Dr. George C. Ruhland, *of Milwaukee:* Those of us who are in public health work and who realize that the problems, especially in America, are rather pressing for a solution of the disquieting observation that life for us is shorter than it is for our European cousins, it is apparent that we must do something to prolong human life. To my way of thinking the problem we have to solve therefore is, how are we going to do it? Each worker in the field of public health undoubtedly has his own methods by which he means to attain this particular point. During the twelve years that I have been devoting my time exclusively to public health work, my thoughts have centered upon one thought through which I hope to get nearer to this solution.

At the present time I believe that the way in which we can get nearer to the solution of the problem is through publicity. If I had to work with only one agency to attain this point, I would ask for a full and overflowing measure of publicity.

As Osler has said, what we need is teaching, not in disease but in health. He says this teaching should be popular—directed to the public. From my observation and contact with the medical profession, I think, however, that the medical profession, above all, is in need of such teaching. I think it is very discouraging, and one of our greatest handicaps, that the rank and file of the medical profession has no understanding and very little sympathy with the public health officer whose activities they consider largely an infringement upon and an interference with their private practice. The moment we want to force through some problem of preventive medicine, they believe that it is taking away from them their bread and butter. Unless we can make them see the difference in public health work, get them to change their viewpoint, to the Chinese system, if you please, of paying a doctor only so long as you are well, we will have this opposition to meet. So, to gain our point, we must educate the medical profession and must also, of course get the public to understand our problems, and then will be forthcoming the financial as well as the moral support, which I believe this problem requires.

Dr. Henry F. Vaughan, *of Detroit:* Mr. Chairman, I think you might just as well have left the "doctor" off, because I feel rather like a stranger here. I am a sanitary engineer and not a real doctor. Doctor Rucker has stated that health in the past has been considered solely a medical problem, as an artificial state to be achieved and maintained solely through the interposition of medical safeguards. It seems to me that there are undoubtedly many phases of public health administration which can be handled more effectively and more efficiently by the business man, by the engineer or by others. At first it would seem that there is very little close connection between infant mortality and engineering, but I think a simple examination of these activities will show a very close relationship. It is the usual custom, I believe, in most large cities in assigning work to tuberculosis nurses, contagious disease nurses, infant welfare nurses and others, to divide the city into a number of districts and assign one to each nurse or inspector. This system was abandoned in Detroit three years ago and the unit system was adopted in its place. We divided the city into 600 small districts, and made city maps which were blue-printed and on which appeared nothing but the district boundaries and numbers, no street numbers or street names. Street index cards are used for the rapid location on these maps of all births, deaths, insanitary conditions and other matters that pertain to the public health. We have done away with the old-fashioned pin map, which was never satisfactory, and substituted in its place a system of permanent records, each being comparable with the other, and a compilation of which gives us an index to the city's health. The number of births and deaths under 1 year for each year, and the corresponding infant mortality rate is computed for each one of these small districts. A nurse's district is then built up of as many of these bad units as she can conveniently handle. The bad units are those in which the infant mortality rate is above the city average. The nurse visits only those sections of the city in which her efforts are most needed, eliminating in this way many square miles of territory in which her work would be of practically no value. As a result of this intensive method in typically bad districts, the infant mortality rate there has been reduced from 201 to less than 90 per thousand births. The same general procedure has been applied to our work in tuberculosis, contagious diseases, housing and other inspection work, and we can now readily assure the City Council that they will receive a just return for every cent spent in this manner. We go so far as to appear before the Common Council and state that for a given expenditure for nurses in certain specified blocks in the coming fiscal year, we will save a certain definite number of lives.

Dr. J. S. Neff, *of Philadelphia:* I thoroughly agree with the paper in every way and hope to live to see many of these ideals attained. I have only one criticism, and that is I think the author is too severe on the conduct of public health officials in most of our municipalities, and I seriously object to his statement that instead of "public health departments" these should be called "public disease departments." Many of our municipalities have done admirable work in preventive medicine; in medical school inspection; for example, they not only diagnose and exclude children with communicable diseases, but examine every school child, detect and have remedied physical defects. Child hygiene departments see that proper food is supplied, teach the mother how to prepare it, as well as take care of sick children. Prenatal work, done so well in the past few years, in many cities, is of the highest order of preventive activities. I also call attention to the betterment of the milk supply; there is hardly a city of any size in the United States whose health authorities do not control the milk supply from the dairy farm to the consumer, and require its pasteurization in such manner to prevent the spread of disease. There are many other examples of preventive work that could be cited if time did permit. We have many shortcomings and fall far short of the ideals as elucidated in this paper, but at the same time, I do not like the hypercriticism of the "poor work" of municipal health officers.

Doctor Rucker: I want to thank those gentlemen who have discussed this paper for doing exactly what I expected them to do. This paper was intended as an irritant; it was expected to get under the skins of a good many people; it was intended solely for the purpose of making people think, and I think that we have had a little bit of thought this morning. The main point that has been brought out in the discussion is the fact that this program is idealistic. Every program that is going to get anywhere must be idealistic and we must work with that idea in view, remembering that at the end of three years' work, Mohammed had just exactly 13 converts, yet he was able, because he had a great big live human idea, to create a religion which now embraces more people than any other religion in the world. Now we have a religion of the sacredness of man's body, and I think that our ideals cannot be too high in this regard. The reason that we have not, in the past, attained the major position which we should, the reason why the other departments of the cities and the people themselves consider us of minor importance, is the fact that we have been thinking in nickels when we should be thinking in terms of a million; we have taken ourselves at too small a value; we have placed our aims and our ideals on too low a plane. We should take the position that our work is the important thing upon which rests the success of all of the other activities of communal existence, because health is the starting point of success in community life. We should remember that we are now emerging from the stage of individualism into the stage of collectivism and that as such, we as health wardens, must reach out and touch every activity of the community. I am sorry if I have hurt anyone's sensibilities by speaking of the "disease department," but I ask you if there is not a great deal of truth in that? Perhaps not an entire truth, but at any rate, it is a part of a truth. I am sorry that Doctor Levy did not understand all my sentences. As a matter of fact, I didn't understand them myself, but they sounded so nice I just had to put them in.

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THE IMPORTANCE OF UNIFORM CULTURE MEDIA IN THE BACTERIOLOGICAL EXAMINATION OF DISINFECTANTS.

Abstract of paper entitled, "The Importance of Uniform Culture Media in the Bacteriological Examination of Disinfectants," by J. H. Wright, read at the meeting of the Laboratory Section, American Public Health Association, at Cincinnati, Ohio, October 27, 1916.*

Careful analysis of large numbers of determinations of phenol coefficiencies upon many different disinfectants has led the writer to believe that the great majority of the discrepancies obtained in such tests are due to variations in culture media. A long series of experiments has been performed to detérmine the cause of these variations. These experiments have included a study of the uniformity of Witte's peptone, Liebig's extract of meat, and particularly the study of the influence of the hydrogen ion concentration of culture media upon the resistance of B. typhosus to the action of disinfectants.

So far as the writer's experience is concerned there is no evidence of a lack of uniformity in Witte's peptone. Liebig's extract of meat, however, should be regarded with suspicion.

The greater part of the difficulty undoubtedly lies in our present methods of adjusting acidity, which give, even under the best conditions, large variations in hydrogen ion concentration. It is shown that there is a very distinct relationship between the resistance of the test organism and the hydrogen ion concentration of the culture medium in which it is grown.

It is recommended that for the standardization of disinfectants the following medium be employed: 10 grams of Witte's peptone, 3 grams of Liebig's extract of meat, and 5 grams of salt, with no adjustment of the acidity. This is shown to have a hydrogen ion concentration most favorable for the normal development of B. typhosus.

A careful study of various American brands of peptones was also made, with the purpose of ascertaining, if possible, their availability for standardization purposes.

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A PROGRAM OF PUBLIC HEALTH FOR TOWNS, VILLAGES AND RURAL COMMUNITIES.

GUSTAV F. RUEDIGER, M. D.,
Health Commissioner for LaSalle, Peru and Oglesby, LaSalle, Illinois.

Read before the Public Health Administration Section of the American Public Health Association, Cincinnati, Ohio, October 26, 1916.

THERE appears to be a unanimity of opinon that public health work and sanitation have progressed more rapidly and are farther advanced in our metropolitan districts than in the small cities and villages. In the rural districts the pioneer workers have just begun to make their appearance, but very little constructive work has as yet been performed. In many respects the problems in the cities and those in the towns and villages are alike, but overcrowding in the tenement districts of the former may bring about complications that are not commonly met with in the small towns. On the other hand we have housing conditions in LaSalle and Oglesby that are just as insanitary and overcrowded as are the poorest districts in most of the larger cities.

If the public health problems in the large centers of population are fundamentally not very different from those commonly met with in some of the towns and villages, then let us see why there has been so little progress in the latter as compared with the former. I am convinced that the difficulty is chiefly a financial one. Public health is a purchasable commodity and can be had by any community that is willing to pay the price, but in the small towns and villages that price may be so high as to be almost prohibitive. This is due to the fact that the unit for establishing a more or less independent health department is too small. The population embraced by it is not large enough to support an efficient and properly organized health department. Where is there a town of 1,200 to 1,500 inhabitants, or even of 3,000 to 5,000 inhabitants, that can afford to have a full-time health officer, a school nurse and a food and dairy inspector. No doubt there are communities who could afford to do it if they made up their minds to it, but the cost looms up so big to them that they will not undertake anything, unless it be the appointment of a busy practitioner of medicine to quarantine houses as occasion demands.

It would seem, therefore, that we must enlarge our units for establishing health departments before we can hope to have efficient health administration in the small cities and villages. This no doubt can be successfully done by coöperation of neighboring municipalities as has been done in LaSalle, Peru and Oglesby, Ill. and in Wellesley, Belmont, Needham and Framingham, Mass., but this plan leaves out of consideration the rural communities which most of us are convinced ought to be reached. I have given this matter careful consideration and it appears to me that it is a mistake to separate the small towns and villages from the country districts surrounding them, in so far as public health administration is concerned. Many of the health problems that confront the small cities and villages are met with almost as frequently in the country surrounding these places and need to be dealt with in precisely the same manner. It is very obvious that a diphtheria bacillus carrier in a country school will do just as much harm as one in a city school and the only proper way to deal with the situation is to find the carrier, by means of throat and nose cultures, and exclude him from school. This, however, is rarely done under the present organization, especially in those states where the country districts are looked after by a county health officer who has to earn his living by practicing medicine, and who may live as far as thirty to forty miles from the school in question.

In Illinois the congressional township is the recognized unit for the establishment of a township high school, and such a high school district may embrace both farming communities, villages and cities up to 100,000 inhabitants. Two or more adjoining townships, or two or more adjoining school districts, whether in the same township or even the same county or not, may unite and establish and maintain a township high school. It has occurred to some of us who have given this matter careful consideration that a similar basis should be adopted and recognized by state law for the establishment of public health districts. Such a district must not be too large in area but should have a population of at least 25,000 to 30,000 people. The congressional township, which is six miles square, is a convenient basis for establishing such public health districts, but in many instances it will be necessary for two or more neighboring townships to combine in order to get the desired population; but in no instance should the district include more than ten congressional townships and these should then be located in a square block. If larger areas are permitted to be used as the unit the distances to be traveled become too great for efficient service.

These public health districts should be presided over by a board of health composed of three or five members. The members of this board may be elected by the people just as the members of the high school board are elected, for periods of three years, but only one, or at most two, should retire each year.* The board should appoint a well trained, full-time health officer, two or three public health nurses, a food and dairy inspector, and if possible a bacteriologist, who could at the same time serve as office attendant. The board must also have power to levy a special tax for the support of this work. If the community is large enough a medical school inspector should be added to the staff. The health officer must be the executive officer of the board and must be given great freedom of action in all matters coming up for his attention. The actions of the health officer must be guided by the state laws and the rules and regulations of the State Board of Health, and also by the city ordinances when dealing with problems within the corporate limits of any city or village in this district. Under this plan, garbage collection, which is a service rendered only to the cities or villages in the district, must be charged up to the streets and alleys department of the city or village getting the service and not to the health department of the district.

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*It is feasible also to have the board appointed by the county judge of the county in which the district is situated. In either case, in states under political organization like Illinois, it would be necessary for the people of the district to decide by a vote whether or not such a public health district shall be created.

The program of activities of such a health department should include the following lines of work:

1. Control of contagious and communicable diseases. The health officer or someone on his staff must visit every house where a case of contagious disease is reported and make a careful investigation into the probable source of infection and the danger of its spread. He must give advice in regard to the disposal of bodily discharges and take all necessary precautions against the spread of the disease. Provisions should be made for isolating the sick in an isolation hospital if the conditions in the home are such that satisfactory isolation cannot be procured. In cases of tuberculosis advice should be given in regard to the diet, rest, sleep, exercise, etc., and especially should the health of the others in the household be safeguarded. Visiting nurses should call upon these patients to give detailed instructions and to see that these instructions are followed. The cases requiring special treatment in a sanitarium should be urged to go to such an institution.

In communities where there is an active anti-tuberculosis society the health department should seek to coöperate with that organization. In LaSalle we have an agreement with the Anti-Tuberculosis Society whereby they and the health department employ a public health nurse jointly. Each of the contracting parties pays half of the salary of the nurse and she devotes half of her time to visiting tuberculous patients and the other half to the schools in Oglesby. She is entirely under the direction of the health department, but also makes monthly reports to the Anti-Tuberculosis Society in so far as that part of the work is concerned.

2. Medical inspection of school children. The health officer should have a working agreement with the different boards of education in his district, including the country districts, under which he acts as the medical inspector of schools and supervises the work of the school nurses. It is a mistake for a small community of less than 50,000 inhabitants to engage a part-time health officer and a part-time school physician. Medical inspection of school children is largely a preventive measure and in the smaller cities and rural districts should be in charge of the health officer. By combining these two offices it will be easier to engage a full-time man, with a decided increase in efficiency of the entire work.

All children should be given a passing inspection on the first day of each term of school. During the term the schools must be visited at frequent intervals by either a school nurse or the health officer for the purpose of investigating any cases of sickness that may exist among the pupils. When children are absent from school for any unknown cause home calls must be made to determine whether or not they are suffering from a contagious disease. Whenever a case of diphtheria or scarlet fever is found among the pupils, special precautions must be taken by daily inspection or by throat and nose cultures from all contacts.

Once each year the nurse should make a physical examination of every child including tests of vision and hearing and a careful examination of the nose, throat, teeth, nutrition and general cleanliness. All children with ailments requiring the attention of a physician or dentist should be referred to the health officer for verification of the nurse's findings and the parents must then be advised of the necessity of providing proper treatment.

3. Infant welfare work and prenatal instruction. At least one of the public health nurses should give a large part of her time to the health and care of infants. Young mothers and prospective mothers must be given instructions and often demonstrations in the care and feeding of infants.

4. Food and dairy inspection. The food and dairy inspector should make frequent inspections of all grocery stores, meat markets, restaurants, hotel kitchens and dairies, and must collect samples of milk and cream for the bacteriological laboratory. I am convinced that dairy inspection without a bacteriologic control of the milk supplies is bound to fail in getting the best results. This was clearly demonstrated by our experience during the past summer. Our dairies are inspected and scored by a competent veterinarian. Most of them are given fairly good scores, but our bacteriologic analyses of the milk showed that the bacterial counts frequently were above one million per cubic centimeter when the milk was delivered to the retailer. Most of this milk was drawn by a milking machine and a careful investigation by the writer showed that the high bacterial counts were due to improper cleaning and failure to sterilize the teat-cups and tubes of the milking machine. In several instances we got counts of over two million per cubic centimeter, immediately after the milk had been drawn with one of these machines. The teat-cups and tubes were then thoroughly cleansed and scalded and the counts were reduced to less than twenty thousand.

5. Sanitation and abatement of nuisances. Under this head must be considered the insanitary privies, open sewers and cesspools where such exist; the housing problem and many other problems of a similar nature. In communities with 10,000 or more inhabitants the health officer should have the assistance of the sanitary police officer in this work.

6. Publicity and public health education. The health officer and other members of his staff must welcome all opportunities to give public health talks before clubs, societies, parent-teacher associations and other gatherings. Of particular importance in this respect is the work of the school inspector, school nurses and other visiting nurses in the community. Newspaper articles should be written from time to time. By carefully choosing topics that are of more or less general interest locally at the time I find a ready coöperation on the part

of the newspaper editors who will even ask for such articles if they know that they can get them. Some of this work no doubt should be paid for, but a great deal of it the newspapers are willing to accept free of charge.

DISCUSSION.

Dr. W. S. Rankin, *of Raleigh:* I think I will start my discussion with this fundamentsl principle, that, regardless of the size of a unit of health administration, whether it embraces only a thousand or five thousand people *or* five hundred thousand people the successful administration of that health unit demands the knowledge of specialists. For even a thousand or two thousand people, the general man, one man, cannot supply the health needs, cannot meet the sanitary administrative requirements of that unit. To illustrate, I do not think there is a single man in this audience—and I have the highest respect for those who make up this audience, who would make a good whole-time county health officer if that whole-time county health officer had to do *all* of the health work himself, for the reason that there are so many different problems in the county requiring special training. Take, for example, the medical inspection of schools, the examination of dairies, the laboratory work, the periodic examination of adults for common defects (corresponding to the examination of school children for their common defects), one man could do some of those things but not all of them. In other words, the general man cannot supply all the health needs of a community, regardless of its size. How are you going to meet that situation? Doctor Ruediger has suggested one way, take a number of towns or counties and combine them into a health district, and from that aggregation levy a large enough budget to finance a department instead of a single officer; of course the general man must be the head of the department, but give him specialists for handling the different departments; he would have his school inspectors and then somebody else to do the periodic examination of adults, etc. That is the remedy suggested by the speaker, and I am thoroughly in accord with his suggestion, the combining of communities, counties or towns, where it can be brought about, with a view of raising a large enough budget to permit the general supervisor to have enough assistants to give him efficiency in the handling of the special problems of his department.

There is another way; take a county of 15,000 with a town of only 3,000—a truly rural community; go to that county and say: "Here is your total health problem; that is divisible into a number of health units; here for example is your school inspection unit, which is separate from the soil pollution unit; we will make the inspection in accordance with this plan for five or six hundred dollars." The county pays the state and the state puts its man there and does the work; then it will take the tuberculosis problem and other problems in the same way and send different men to do those units. It would not send the man to do medical examinations that would do the school work. That is the method followed in some counties, the division into a number of units, and then the state contracting with the county to handle those different units for a definite sum, according to a definite scheme.

Dr. Jacob M. Furstman, *of Lacrosse, Wis.:* There were several points brought out in Doctor Ruediger's paper which I was glad to hear, because the conditions in LaCrosse are practically the same, although LaCrosse is a larger city than Doctor Ruediger included in his program. We feel the need of having it made a county instead of a city department. The city comprises two-thirds of the county of LaCrosse and we encounter a great number of difficulties just outside the city limits. LaCrosse was one of the first cities to get its health department out of politics. We have a board of three members, appointed by the mayor, one new member appointed each year for a term of three years. The health officer, in his tenure of office, is entirely out of control of the Common Council. We are endeavoring to follow out the program Doctor Ruediger suggested, by careful investigation of contagious diseases, medical inspection of schools, dairy and sanitary inspection, infant welfare work, and I am sorry to say that the collection and disposal of garbage is still under the control of the Health Department. As to school inspection, I wish to say that it is next to impossible to get money from the Council for school nurses. We have had one paid nurse in LaCrosse for six years, and all that the city pays toward her salary is $250 a year; the balance is made up by a tag day and Christmas campaign; but we have, in addition, four nurses; we have a senior nurse whose service is rendered to us from each of the hospitals; a nurse about ready to graduate to do the follow-up work; we all realize that medical inspection of schools without the follow-up work amounts to very little; we have consequently five nurses under the supervision of the Health Department. The least amount of money we could get the services of these nurses for would be $4,800 a year. The city of LaCrosse pays $250 a year for that service. While the nursing service is not ideal, we have been able to increase the attendance in schools to quite a degree. The attendance in the schools in 1910, the latter part of 1910, was 89 per cent.; in the latter part of 1915, it was 97 per cent. While I do not attribute it all to the medical inspection of schools, I think a great share was due to the fact that the children were followed up immediately, when out two days from school, to ascertain whether the child, or any other member of the family, was suffering from any contagious disease. In dairy inspection we have accomplished quite a good deal in the improvement of our dairies, and we have to do that just at times when we can best spare the time. The department consists of the health commissioner and one assistant who does the outside work. There has been discussion of specialists, of one man not being able to do all the work. That is true but we have got to content ourselves with doing all we can in smaller communities until we can educate the public to the value of having a larger force, and in that way obtain better results. In making the Health Department of LaCrosse a county unit its efficiency would undoubtedly be increased. It is difficult for a city centrally located in a county that has a well organized health department with only imaginary lines for its boundary where its jurisdiction ceases, to do the most efficient work as the work in the city and the rest of the county practically dovetails together.

There is no question in my mind but that the sooner the county system of health departments would be adopted the greater the efficiency of public health work would become.

In bringing about this change it is hoped to include the small villages and towns where the work is not only most neglected, but most needed.

Dr. L. L. Lumsden, *of Washington, D. C.:* Mr. Chairman and Members of the Section: I am not sure that I have clearly in mind just what we are trying to discuss. The program states that the subject is a program of public health for towns, villages and rural communities. It seems that so far the discussion has been directed especially toward health organization in rural communities and much of it has appeared to me to be of a rather idealistic trend. We can miss a target just as thoroughly by shooting over it as we can by shooting under it. I rather prefer, in actual practice, to aim a little low. By so doing we have a chance for the bullet to bounce and hit a leg. It may be well to indulge in discussing these idealistic programs; it is good mental gymnastics, and in time may lead to something practical, but I think it more important, in discussions of these great subjects, for us to aim at something practical, something concrete. We all realize that every rural community should have an adequate health organization. I do not think that any of us are willing to concede that any community is so poor that it cannot adjust itself to some practical scheme to get an adequate health administration, but, as practical health men, we realize that to get a health program started, we must get the people to see the sense in investing their money in health work. I think the crux of this problem is how to get the people "wised up" to the fact that an investment for adequate health work is one of the best dividend-payers that any investment can yield. How to get this "wising-up" started is a considerable question. Most important, I think, is to get some—if only a very little—of our goods delivered for the people's inspection. In this connection I am attracted by Doctor Rankin's unit scheme of work, but I am very much impressed with Doctor Furstman's suggestion that, in order for work so started to be made to stick, we must have someone constantly on the job to keep nursing it along. We need, I believe, in every rural county with a population of over 15,000 a good, wide-awake county health officer, a full-time man, and MAN spelt with capital letters; a man with a personality, who can get the confidence of the people he is serving. He needs to get the people to believe in him; he needs to get them to believe that his suggestions are practical, common-sense suggestions; but, Mr. Part-time County Health Officer—and you are always with us—what can you do in your little town or rural district to get something started? I make to you this suggestion: Concentrate your efforts to obtain something in the way of a concrete result so that the people will see that something has been done and have a sample of your health goods for inspection. As Doctor Evans suggested, you may, as a starter, get the milk supply improved, or take a favorite old prescription of mine and go after the ragged edges of the town, outside the sewered districts and concentrate your work in getting the sorest of all the sore-spots of the town, the insanitary toilets, put in sanitary condition. I know of nothing else which will give a town or rural community a better start in health work and progress generally than will the sanitation of the unsightly and highly dangerous privies. After the accomplishment of this concrete result the difference in the looks of things is inspiring, and everybody feels better. In a little town in North Carolina last summer this measure was carried out. There were about a thousand people in the town and all of the toilets were insanitary, open toilets. All the privies were made sanitary. About a month after this was done I revisited the town and said to the old hack driver, "How is everything going, Uncle Tom?" He replied, "Oh, the town's booming: we have put in a new barber shop and a moving picture theater, and the town is on the way."

Mr. Frank J. Osborne, *of Orange, N. J.:* Mr. Chairman and Members: You have listened this morning to representatives of two ideal schools of public health administration; Doctor Ruediger's plan of health units, health districts, composed of cities, towns or rural districts combined into larger units in order that more finances and a better equipment might be procured; Doctor Rankin's scheme of a group of specialists able and willing to sell their services to smaller towns which are not in position to employ such expert consultants; and both of them seem to me most ideal. We tried the first in the Oranges, a group of five cities of approximating 100,000 population, and three of them very nicely agreed to the scheme which was outlined, but the fourth, the one which happened to be the richest and most influential and powerful, refused, and consequently the whole project fell by the wayside. In the Oranges, however, we have hit upon a system of compromises, and compromising is a very poor general policy because the more you compromise the harder work it is eventually to dig your way out into the ideal, or more perfect scheme. However, in the Oranges we found it most practical to combine, where we could, with private organizations, with the other health departments, with hospitals, etc., to get in part what we had hoped to get in full; and I would like to outline very briefly four specific, concrete instances of coöperative public health combining.

The first came on the crest of the anti-tuberculosis control wave back in 1905 or thereabouts, in which the Anti-tuberculosis League of the Oranges was formed, and about five years later a nurse engaged. She was immediately made a special inspector of each Board of Health with authority to investigate the cases, instruct in the homes and report to the health officers and take care of anything which might, either directly or indirectly, influence that particular problem. Very recently one of the cities has paid a part of this nurse's salary and the eventual aim is to have her completely taken over by the health departments.

In the baby welfare situation up to 1913 there was no definite plan. The Woman's Club had provided a part-time nurse who was attempting to scatter herself over an area of about ten square miles and care for 10,000 families. It was found to be absolutely impractical; but by combining four private organizations with the Orange Health Department and employing three nurses and districting the city into seven baby welfare districts in each of which was a weighing station, a physician and nurse as consultant, we have reduced the infant mortality rate from 135 to 75 in six years.

The milk control work was practically on the same basis. There were 60 dealers selling in five towns, only eleven of which sold in a single town; in other words, forty-nine were more or less duplicating. The dairies, of course, were more or less common, and it meant that each city was obliged to send to each dairy a separate man, which added to the confusion of the dairyman and also was a drain on the finances of the various cities. The Woman's Club again employed and gave to the Orange Health Department the services of their Field Secretary. She studied the problem, did the laboratory examination for a year, called a mass meeting in the Woman's Club, which is composed of 700 of the most influential women in the Oranges, and finally got that particular combination plan whereby we now have a joint milk inspection service.

Dr. William E. Park, *of Rockford, Ill.:* Doctor Ruediger spoke regarding the financial reasons why the rural districts have been handicapped. I would go back of the financial reasons and place it at the door of lack of publicity and public health education. We know that the larger cities have made greater advances along this line than the smaller communities. Their starting-point was educating the public, and through that education they were able to get better appropriations. Furthermore, in the larger cities, the woman's clubs and other civic organizations are constantly spreading health education among the people, and in the rural districts they are more or less robbed of this support. There has been a great deal said of publicity, and I will just have you reflect on what Doctor Hastings said regarding publicity, which will save my repeating it. Increasing the unit at present I do not believe would be a remedy; at present I believe it would be a little complex. I believe we should have a state minimum per capita; we have it with the game, we have it with parks, we have it with school boards, and still safeguarding the health of the people is not taken with the same serious consideration as with the little fishes. I believe that there should be a standard brought about through the federal government and the states with the small town or village or rural district, where the federal and state authorities might be constantly in touch with them, holding to a uniform standard throughout all the rural districts, as human life is worth as much in one rural district as another. I believe that a board of health would be more satisfactory by appointment rather than by an election; and after all, I believe that this will call for legislative enactment before anything different can be done. Isolation hospitals are more needed or just as much needed in the rural districts as they are in the larger cities, as you must consider you have the milk supply and we all know how many cases of contagious and infectious diseases are traced down to the farm. In many cases where they haven't double facilities, it is impossible for them to have a case of diphtheria and carry on a safe quarantine that will protect their milk supply; while, in a case of that kind, the case could be moved to the isolation hospital and they could go on with the sale of milk after the proper steps have been taken in disinfecting and fumigating the premises. I have noticed in the last few years a great many complaints coming from rural districts, from the townships. They are becoming so that an insanitary neighbor or a dirty neighbor is as objectionable to them almost as in the city; it shows that through publicity the rural districts are clamoring for something better.

Earle B. Phelps, *U. S Public Health Service:* Doctor Ruediger's work has been followed with especial interest by the present speaker, because it was modelled more or less closely, although under somewhat different conditions, upon the lines of an experimental study of the possibilities of coöperative public health administration which he inaugurated in Massachusetts in the fall of 1912.

It is becoming increasingly evident among public health workers that local health administration in small communities is woefully inefficient and that this weakness, existing at the point of practical application of our accumulated knowledge, presents one of the most important present-day problems in public health administration.

The basic facts of the problem are readily stated. In the report of the Massachusetts work previously alluded to, they were summed up as follows:*

"The local health office in the smaller communities is the most essential and least efficient part of the present-day public health machine. The highly specialized character of public health work and the financial inability of the smaller community to support a properly trained health organization are in large measure responsible for this condition."

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*Phelps, Earle B. Coöperative Public Health Administration, An Experiment in Small Communities, Rep. No. 222, U. S. Public Health Reports, Sept. 25, 1914.

Nor is the remedy far to seek. Obviously, in general terms, it lies in an increase in the size of the administrative unit, as stated in the continuation of the above quotation,

"Consolidation of adjoining communities in a coöperative health office will provide a sufficient population to support the requisite minimum organization for efficient health work at a per capita charge much less than that usually imposed in the larger cities for work of a similar character."

That the events of the past summer have emphasized the importance of these matters in the minds of sanitarians may be inferred from a few quotations that have come to hand within a week.

The New York Department of Health, in its *Health News* for September, 1916, says:

"The pitiable record of suffering, crippling and death caused by the prevailing epidemic of infantile paralysis will not have been wholly a vain sacrifice if the lesson that it is teaching be taken to heart and not soon forgotten, namely, the utter inadequacy of most health districts throughout the state outside of the larger cities to meet great emergencies. This is attributable to factors which are common to all rural health districts and also to those which are peculiar to individual districts. Among the first is the lack of county health organization with provision for concerted and uniform action of all local districts within a county during an emergency, instead of, as at present, the promulgation of a multiplicity of ordinances, rules and regulations often contradictory and enforced to a varying degree with the resulting conflict of authority, ill feeling and reprisals among the different communities, all to the detriment of efficient sanitary methods."

In this same vein, a well-known sanitarian has recently said:*

"When communities are not big enough to maintain a department of epidemiology of the first class, such service should be established for the district or county."

Also, the New Jersey Department of Health in its September, 1916, *Public Health News*, says (p. 45):

"Each township, borough, town, village or city in the state is a sanitary district and is thus a unit for the organization of local health activities. The majority of these units are so small that sufficient funds cannot be provided for adequate public health work by a reasonable rate of taxation. The result is that health work is left undone. The remedy . . . is to enlarge the administrative unit, . . ."

The application of the remedy under various conditions of local and state government demands, and is worthy of, the most serious study, discussion and experiment.

In certain states the necessary legislative authority is already provided for the voluntary consolidation of towns in matters of public health administration, although it may be frankly admitted that these provisions have in the past referred more to economy than to improved efficiency. In other states the county has been adopted as the political unit of health administration while in still others the jurisdiction of the cities may be extended into the surrounding country within a radius fixed by the size of the city itself. Along somewhat different lines the extension of state control is finding favor in certain cases, most notably in New York state, and to a lesser degree in Massachusetts and elsewhere. While the principle of local self-government is, in many of the states, most jealously guarded so that the people would hardly tolerate for the present at least an extension of state control of local public health matters such as has been undertaken in New York, it cannot fail to become increasingly apparent that the extension of the New York idea to its logical limit, the placing of public health administration among those state functions with which the cities and towns have ceased to deal, is worthy of serious discussion.

A principle of democratic government is that each unit from the individual to the state shall be self-governing in those matters which affect that unit and no other, and that where there are matters of common interest among several units the right of self-government exercised by each shall yield to a similar right of a higher unit of all interested groups. Thus the freedom

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*North, Charles E., M. D. Epidemiology and Preparedness, *Medical Record*, August 12, 1916.

of action of the individual, his right to self-government, is unrestricted until it comes into conflict with the rights of others. Likewise in the community, self-government is limited to matters of local influence and sharply delimited from matters affecting the general, extra-community, welfare. Interstate interests are in the main vested in the federal government, while the latter in its world relations is not free of the restrictions imposed by international law and world sentiment.

With this principle in mind it will be of interest to see with what other local matters the important subject of public health is now grouped and also what interests have in general been delegated to or assumed by the state. Among the items of purely local control are taxation and appropriation of local funds, the fire and police departments, parks and streets, libraries, public buildings, municipal charities, and matters of a similar nature. Under the partial control of the state are, the borrowing of money, education, building inspection, hospitals, water and sewerage, municipal accounting and similar matters, while the state has, and in general exercises, supreme authority in such matters as food and drug legislation and inspection, the sources and control of water supply, the methods of sewage disposal, the handling and control of epidemics within the state, the higher courts, the regulation of public utilities, banking, insurance and corporations, state hospitals, schools and universities, the licensing of medical practitioners and all other matters affecting the welfare of the people of the state as a whole, and local interference with which lead to confusion and loss of efficiency.

A careful perusal of this list should convince any thoughtful student of this problem that public health administration, as a whole, belongs properly in the last rather than in the first group. No single item in this enumeration is more dependent than is public health upon uniform legislation and efficient expert administration; nor was the experience of the past summer required to demonstrate, as it has so amply done, that in no field is the welfare of one community more dependent upon that of another than in the field of public health. May we not, therefore, confidently look forward to a natural solution of this vexing problem in an extension of state authority and effort and the gradual elimination of the town and village health office with their conflicting codes and procedures, inexpert personnel and notoriously inefficient efforts? In such a consummation the extremes of local self-government and of state jurisdiction would happily meet for the logical outcome of the plan of coöperative health administration, developed in Massachusetts and so ably worked out by Doctor Ruediger in Illinois is state-wide coöperation which is but state control by another name.

Dr. H. B. Wood, *of Charleston, W. Va.:* Communities are apt to work cohesively rather than adhesively; this is a point which needs to be considered more by the states. Chesley, of Minnesota, several years ago began the reciprocal notification of diseases. That has been taken up by very few states, apparently; there is an advantage in the state and counties recognizing that beyond their own borders lie other communities. The reciprocal notification between one state and another of the principal communicable diseases and the conditions which exist in the border counties, is of importance and needs to be considered.

To develop the work of a county or town health office it seems advisable to construct a definite seasonal program of work. There is a tendency for health officers and also for communities to work along in public health lines without any fixed idea of relative values and without anticipating what needs to be done. Some health officers, upon assuming office, complain that they do not know what should be done, or what is required of them. A definite printed program of monthly work will help the communities and their officials to appreciate their needs; it will develop particular lines of work when they are needed; it will anticipate the needs and make the work, which is intended to meet these needs, timely, seasonal and effective. A regular program of work keeps the various health officers working in unison upon the same branches of labor, making their activities and their results comparable. The activities, no matter what they are, should be developed each year on time, and should be begun when their need is greatest.

Dr. W. A. Sawyer, *of Sacramento:* I am exceedingly interested in Doctor Ruediger's report, because we have just finished drafting a bill for increasing the size of our local unit for health administration in California. I think Doctor

Ruediger has not aimed too high, but he had in mind too definite a type of community. In the first place, he permits only those communities to band together which have a minimum population of 25,000. This requirement would rule out two-thirds of the communities which we want to benefit by this reorganization. In the original draft of our bill, there was a population limit of 20,000 and I was very glad to be instrumental in striking that out. Then, moreover, he puts a limit on the size of the area of the unit or district. This again excludes from the benefits of the plan the essentially rural communities which need the most attention. In some parts of our state it would take two or three counties to bring together a reasonable unit, and some of our counties, as you may know, are very large in area. I believe we can overcome the obvious difficulties of transportation and give the sparsely settled districts a good public health administration, if we allow counties, as well as small areas, to combine into local health districts and support their health work through taxation. We need to enable communities to establish administrative machinery which will fit their size and population. In planning to meet the problem in our state we are trying to avoid specifying in minute detail just what this unit must be and just what it must do. We have put down one requirement, that they must have a full-time health officer who is a graduate in medicine, sanitary engineering or public health, and has had one year's experience in public health work. If a local unit can afford to employ such a man, no matter how large the area of his jurisdiction would be and no matter how small its population would be, we think the people in the unit deserve the opportunity which would be given by an enabling act permitting them to organize a health department. The state board of health should do all it can to establish as many of these units as possible, and to help the small towns and rural communities to combine to get health protection.

Dr. H. D. Holton, *of Brattleboro, Vt.:* I come from the smallest state in the Union We have a State Board of Health, which consists of three men, and a health officer for each town. So we have about one hundred laymen as local health officers, since there are that number of towns which have no physicians and the law prescribes that the health officer must be a resident of his town.

We have an appropriation of between thirty and forty thousand dollars from the state for supporting the laboratory and the different activities of the board. We have fourteen or fifteen men at work constantly.

We have an inspector who does nothing but go from town to town, as the health officers may call upon him, looking up water supplies, epidemic diseases and investigating general sanitary conditions.

The State Board is in close touch with every town in the state.

Fortunately two years ago we had a gift from an anonymous friend of more than twenty-five thousand dollars for the investigation of infantile paralysis.

We are a rural state, our largest city having less than twenty-five thousand inhabitants and a half dozen more running from eight to fifteen thousand.

The individual members of the board frequently do inspection work, when the regular inspector is not quickly available.

We have two hundred and forty-six health officers in the state and wherever possible we appoint physicians to that office, the central board having full control over the local health officers. We aim to have our local health officers everywhere keep in close touch with the State Board.

If some of the states had more inspectors, they would accomplish more by keeping the central board in close touch with different sections of the state.

Dr. J. N. Hurty, *of Indianapolis, Ind.:* Mr. President, I understood Doctor Ruediger to advocate very strongly health boards. I do not find very much virtue in health boards, but I do find a good deal of opposition in them. The health officer generally is compelled to drag his health board along with him, overcome their inertia, and then, after he has done that, overcome their opposition, and finally he gets there. They are a drag. Just let your thoughts revert to the United States Public Health Service; there they have a surgeon-general commander, no board over him at all, and that service certainly gets there. If the members of the service have any ideas, they must present them to only one man; that man is to lead them; he gives his whole time to it; his activities are not divided and he produces results. Results have been produced in Chicago that way. I have a board over me, but I haven't the least complaint to make of my board; they have always come my way, and therefore I am not kicking on them; but out in our state, where there are health boards composed of doctors, sometimes a layman is upon them, they are an absolute block, as a rule, and a drag to public health work. I think we would be far better off without health boards unless perhaps, as in New York state, we have a health commission to pass rules and ordinances, but for heaven's sake get a good strong man and just let him alone and he will work out his own salvation.

Dr. R. W. Bell, *of Toronto:* I don't know, I may be repeating perhaps, something said by Doctor Hastings here before, as I have not been present all the time, but from what I have heard from a few of the speakers lately, I would like to give you a short outline of what we do in Ontario. Our Provincial Board corresponds to your State Board, and consists of seven members. The secretary of the Board is permanently employed by the government; the other members are appointed for three years. Under the Provincial Board we have our Local Boards, one for each municipality, one for each city, town, incorporated village or township, numbering something over 800 in the province. The local medical health officers were being continually changed from year to year in smaller municipalities, and there was no continuity; the result was a couple of years ago we made a change by which our local medical health officers are permanently employed and our Health Act requires for them a reasonable salary. The question arose, What is a reasonable salary? What might be reasonable in one locality might not be reasonable in another. We advised that the smaller municipalities pay $100 for the first 1,000 of population and $50 for each subsequent 1,000. In the larger municipalities of 4,000 population and up, the Board consists of five members; in the smaller, of three. Each of these local health officers makes his report to his Board of Health each year and these reports are sent in to us. These Local Boards are under the Provincial Board. Four years ago we had seven inspectors appointed for the province; the province was divided into seven districts. While we have advocated the county system, the legislature will not carry it out; our legislators are afraid that if a full-time salaried officer is appointed, their constituents will rebel against the expense. However, the government divided the province into seven districts and appointed a medical man of years of experience as district health officer. He has seven or eight counties to look after and has a salary of $2,500 a year at the present time, with all traveling expenses paid. He has a good deal of liberty in his own hands, visits from place to place as he finds it necessary or wherever we, of the Provincial Board, deem necessary to send him. In that way we are accomplishing good results, looking after the installation or supervising to some extent the institution of water works systems, sewerage systems and looking after nuisances generally all over the province. Where a local man wants help, one of our district health officers goes to his assistance and in that way we are accomplishing a great deal at the present time. Last year we undertook to supply all the biological requirements for the province free of charge, where we were formerly charging for typhoid vaccine, smallpox vaccine, etc. We got a good grant from our Ontario government, and today we are furnishing to all municipalities free all the biological products required, and as far as Pasteur treatment for babies is concerned, the patients come in and get free treatment. We have furnished in connection with the war a good many hundred thousand units of anti-typhoid vaccine. All the troops that have gone from Canada, three or four hundred thousand, have been treated with typhoid vaccine furnished by the Province of Ontario, and in this way we are doing a work we are proud of.

Dr. Millard Knowlton, *of New Jersey:* I would like to point out that the coöperative work being done in the Oranges, which Mr. Osborne discussed, partakes of the character of the coöperative work described by both Dr. Ruediger and Dr. Rankin, in that it is unit work done on a coöperative basis by the various municipalities, instead of being done by the State Board of Health as in North Carolina. The municipalities combined for milk control, for the venereal disease clinic and for tuberculosis work. I desire also to emphasize the point mentioned by Doctor Sawyer with reference to the size of the unit. It seems to me that it is rather difficult to have a hard and fast standard for the size of the unit. You will have territory with a population of only three or four to the square mile, and other territory with a population of eighteen or twenty to the square mile, and still other territory in which the population is very much greater. The size of the units must be regulated, it seems to me, with reference to both territory and population, and must, of necessity, vary with reference to the density of the population.

I wish to ask if it is possible to give a numerical rating of relative values in public health work as Doctor Chapin has done in his report on the activities of state boards of health? Is it possible for the committee on the standardization of public health activity, for example, to say that if all lines of public health work be given a total value of 1,000, then contagious disease work is worth 100, vital statistics 100 or 200, or whatever value might be assigned? Is it possible to go through the whole list of legitimate activities for boards of health and give to each a rating of that kind? The activities to be rated vary somewhat with the different kinds of boards. Activities of state boards of health include supervision over local boards, but such supervision is not a function of the local boards. For this reason there must be some variation in rating, depending on the kinds of boards rated. I merely wish to raise the question whether or not it is possible at this time to be so definite as to assign numerical values to the various lines of health work and rate the different health activities on a mathemetical basis?

Doctor Ruediger: I am very grateful to the members of the section for this very free discussion. There is evidence that there are a great many conflicting views on this matter. Some points I want to take up. Answering Doctor Hurty in regard to the objections to the board, I fully realize that there are objections to boards of health, but in order to make this plan a workable one, you must have somebody to appoint the health officer and in the districts I have outlined, we have at present no authority who would appoint this health officer. Moreover, if this health officer were appointed by a single elective officer somewhere, you would have it back into politics, just exactly where we don't want it. So I pointed out in my paper that although this health officer should be appointed by a board, he must be given great freedom of action and must decide many points by himself. I think he should virtually be a health commissioner and decide the points by himself, but there must be an appointive body; moreover, in the scheme that was outlined, this body, which would be the board, must have authority to levy a tax for the carrying on of this work. I do not think it would work to let the health commissioner levy the tax.

We have no council over such an area. Now Doctor Sawyer's point was well taken. I believe that the enabling act must be drawn up in such a way as to be very elastic. I do not believe that the best results can be obtained if the population is extremely small, neither do I think that the best results can be obtained if the area is very large, but in the thinly populated states, it may be necessary to have rather a larger area in order to get the desired population, which perhaps may have to be less than 25,000 as the minimum, as I stated. Another objection was raised, that a board of health by election would not be as good as one by appointment. The difficulty in our plan is that there is no appointing body in the district that was outlined; it can be easily elected. It could be appointed perhaps by the governor, then you would get it back into state politics again. It could perhaps be appointed by the State Board of Health; I do not know whether that would work or not; at any rate, I think you would get it back into politics, no matter which way you turned. Legislation no doubt is necessary in order to give the districts authority to establish such a health department. Now the difficulty in getting the coöperation; we have all realized that it is necessary to get some small group of workers in the community busy to point out just what improvements can be obtained, perhaps at the expense of some private agency, before the community will be ready to vote in favor of such a proposition. In answer to Doctor Lumsden's objection that there was no outline of a program of work in my paper I want to point out that most of the paper dealt with the program that such a department should carry out; perhaps the details were not given, but less than half the paper dealt with the organization of the machinery.

HEALTH ADMINISTRATION ON THE DISTRICT PLAN.

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Secretary, New York City Department of Health.

Read before the Public Health Administration Section of the American Public Health Association, Cincinnati, Ohio, October 24, 1916.

THE rapid expansion of the public health field during the past few years has resulted in the enlargement of old activities and the inauguration of many new functions. Furthermore, present ideas as to public health obligations differ radically from those of bygone days.

Public health problems heretofore were approached from the viewpoint of police duties, such as the abatement of nuisances and the supervision of infectious diseases when they occurred. This has been replaced by the conception of public health work as preventive and educational in character and the recognition that preventive and educational measures must be applied to the individual to secure effective results. No longer can a town be considered as an abstract proposition; the entire population of the state, city or town must be reached in order to impress upon each inhabitant the fact that community health depends both upon his own health and the relation of his health to those around him.

Old methods of administration do not secure these results and the attempt to modify present procedures to meet new conditions, in many cases, has been much like putting new wine into old bottles. For this reason, experiments have been recently developed in many parts of the country to test out new ways of organizing and administering health work. One of the most promising experiments is the so-called "Health Center," which is now in operation in several of our cities, notably: New York City, Philadelphia, Cincinnati, Dayton, Pittsburgh, Milwaukee, Toronto, Buffalo and Boston.

Fundamentally these experiments aim to coördinate and direct health needs of a given district, the size of the district being dependent upon the ability to influence each inhabitant therein. A local office is established from which to direct its affairs. The field of public health activities covered in these cities varies, but to a great extent has been limited to child welfare, and anti-tuberculosis measures. Milwaukee and Philadelphia have concentrated on Child welfare; Buffalo and Pittsburgh have added anti-tuberculosis work; and Cincinnati has combined tuberculosis work and incidental relief measures. New York City in 1913, through the New York Milk Committee, started a center for coördinating infant welfare activities. In all of these places the experiments have been conducted by civic agencies and not by public health departments of the community. In Cleveland and Dayton, however, the Health Departments have coöperated with the district nursing associations in developing a more generalized nursing service. The Health Department of Toronto is trying a combination of infant welfare, school, and tuberculosis nursing, while Boston's experiment embraces curative and preventive measures through the bedside and clinic care of the sick, as well as public welfare and tuberculosis work. All of these experiments were restricted to the development of better methods of public health service in a few of its phases only.

It remained for New York City, through its own municipal Health Department, to inaugurate an experiment on a much more comprehensive basis than any heretofore attempted. In 1914, Dr. S. S. Goldwater, then Commissioner of Health, directed the establishment of an experimental health district within which all the functions of the Health Department were to be locally directed. The plan aimed at the avoidance of overlapping by different bureaus or departments concerned with health matters and an increased usefulness through the establishment of intimate neighborly relations between the Department of Health and the local community. The breadth of the experiment is indicated in the endeavor to demonstrate (a) the value of a district plan of health administration with a view to its application to the entire city; (b) the practical value of directing locally, in a combined form, public health activities, such as infant welfare, school medical inspection, supervision of infectious diseases including tuberculosis, sanitary inspection, and public health education; (c) the development of a community spirit with respect to health affairs; (d) the possibility of coöperating with social welfare agencies and general hospitals in establishing a broad preventive health program.

Within the past two or three years the question has been raised as to whether the administration of the Health Department activities is served best through control centralized at general headquarters. The present organization of the Department consists of nine bureaus, each of which plans and performs its own work by means of its own force operating throughout the entire city. Five of these bureaus are concerned with field work: Bureaus of Child Hygiene, Preventable Diseases, Food Inspection, Sanitation, and Public Health Education.

Brief Description of the Experiment.

The experiment is conducted in an area approximating sixty-three acres in twenty-one city blocks and includes a population of about thirty-five thousand, mostly of Russian and Austrian nativity. Field activities of the following bureaus are covered:

Bureau of Child Hygiene	Prenatal work Infants' milk stations Pre-school examinations Midwife and foundling supervision School medical inspection
Bureau of Preventable Diseases	Tuberculosis supervision Supervision of other infectious diseases
Bureau of Food Inspection	
Bureau of Sanitation	

The staff of the district is as follows:

A health officer in charge
1 medical inspector on part-time service required for the milk station, pre-school examinations and school medical inspections
3 nurses
1 nurse's assistant for the milk station
1 food inspector giving to the district about half a day's service
1 sanitary inspector devoting one to two hours a day to this work
1 clerk

The general principles of "Line-and-Staff" are applied in developing the organization; that is to say, the current routine work is under the direction of the health officer, whose duty it is to see that the work of the district is performed promptly and satisfactorily. The health officer has direct charge of the district staff, which he assigns to duty as he considers best. The staff represented by the bureaus for which the work is being done, sends supervisors into the district to see that the service is being adequately performed.

The district office located in about the center of the area, occupies the basement and first floor of a double five-story tenement house. Three rooms in the basement are used as a milk station; the front one as a conference and clinic room, the second for weighing the babies, and the third as a dressing room. The walls of the front room are covered with photographs selected because of interest to the patrons of the milk station, food dealers, janitors, parents, and to the boys and girls of the district. These photographs are not only those of the Health Department but include contributions from the Department of Street Cleaning, Tenement House Department and Fire Department on matters which concern health activities under their jurisdiction. The first floor has four rooms which are arranged for office and general conference purposes. The walls of these rooms are covered with photographs describing the administrative and scientific phases of the Department, for these quarters are designated for holding conferences between the health officer and various civic workers and organizations of the neighborhood. This floor provides space also for workers coöperating with the Health Department in the experiment, such as inspectors of the Tenement House Department and volunteers from charitable societies.

The district medical inspector by performing school medical inspection work four days in the week, and the service in the milk station the other two days, is able to care for work formerly performed by two medical inspectors in that district.

Three nurses whose work in this area was formerly supervised by three bureaus in general headquarters, now serve under direct district control. During the morning, one nurse is detailed to inspect the infectious disease records; another nurse is assigned to the milk station; while the third is given the school medical inspection work. In the afternoon, all three nurses do the field service, each one being assigned a section of the district. These visits include those to milk station infants, tuberculosis cases and other infectious diseases.

A food inspector gives about three hours of his daily service, as this is sufficient for work of this character in the district.

Very little service is required of the sanitary inspector inasmuch as this district for the most part includes tenement houses, and sanitary inspection of this type of building in New York City comes under the jurisdiction of the Tenement House Department.

A very comprehensive program for public health education has been developed. The publications of the Department, which are for general distribution, have been grouped into appropriate series, such as "Care of the Infant," "The Prevention of Typhoid Fever," "The Value and Need of Vaccination," "How to Care for Food," and similar articles.

At first the literature was distributed indiscriminately, but was modified later to concentration on one special set of pamphlets for each week, thus insuring about fifty different sets to the district inhabitants at the end of the year. These are distributed to patrons of the milk stations, at Boys' and Girls' League meetings, at food dealers' and parents' conferences, janitors' meetings, and to others who may come to the district office. In addition, circulation among the families throughout the district is effected by having the entire field staff leave literature at the homes visited, using the services of the Boys' Leagues, and utilizing the public schools, hospitals and civic organizations as distribution centers. On many occasions, seven to eight thousand pieces of literature on some special subject have been distributed in a few hours through these various channels. A special weekly, entitled *The East Side Chronicle,* is published by our Bureau of Public Health Education for distribution in this particular section of the city.

Under the description of the district office mention has been made of the two exhibits of photographs. In addition to this, a large bulletin board appears on the outside of the building, on which are posted "Health-grams" changed every week by the Bureau of Public Health Education.

Lectures and conferences of a varied character are held. Meetings for mothers are conducted at the milk station, and talks are given by the nurses on the care of the baby. Several Girls' Health Leagues have been organized and meetings are held weekly to receive instruction on health topics.

The Boys' Health League was organized during May. This League is formed on a military basis, with a captain and three lieutenants in charge of each square block. These officers in turn select one boy for each house. Thus is developed a system by which the entire district is well covered for any coöperative Health Department work that the boys may be called upon, and are able, to perform.

The various city departments which direct activities for the conservation of health and sanitation, such as the Tenement House Department, the Department of Street Cleaning, and the Department of Water Supply, coöperate by giving lectures at these meetings of the boys. This secures one good, strong organization for public health work, and avoids many organizations under different city departments covering practically the same field, which results in diffusion of interest and effort.

Many meetings have been held for special groups of workers, such as food provisioners, confectioners, butchers, milk dealers and others. A series of conferences under the joint direction of this Department and the Tenement House Department, have been given to the janitors, with attendances ranging from 50 to 200. At these meetings, the audience is instructed in the rules and regulations referring to their particular occupations, and their coöperation with the work of the Department is requested.

The general attitude of the Department is that of an instructor, relying upon the people to make their local district one of the healthiest in the city. This local pride has been developed to a marked extent and the results are evident by the lessened number of arrests for violation of food and sanitary regulations. The health district took an active part in the Fourth of July celebration in the neighborhood, the Little Mothers' League, the Boys' Health League and the babies of the milk station being assigned a prominent place in the line of march.

The Educational Alliance, which is located within the boundaries of the district, is coöperating to a marked degree. Its lecture hall is used for a series of lectures to the district people on various health topics as a regular weekly feature, with audiences of 100 to 650 people at a time. In fact, there is hardly any organization interested in health work which has not joined in the constructive program established.

The private physicians who have offices in the district are organized in a Local Physicians' Advisory Committee. The various relief societies and social agencies doing work in the district are banded together as a Local Relief Committee. The volunteer civic worker acts as a clearing house through which the health district field force makes the proper connections with the charitable agencies for necessary relief. Principals of public schools, superintendents of hospitals, directors of social agencies, and local civic workers have consented to help in their respective fields, and are organized as a General Advisory Committee.

Other city departments make the district office their local quarters, and their field force aids in the distribution of our literature; our force in turn distributes their literature concerning health matters. The Police Department has been "hitched on" to this community health program by having the patrolmen visit cases where there have been violations as to sanitary and food conditions and the control of infectious diseases, and in delivering cards of instruction and information with respect to infectious diseases.

CONCLUSIONS.

This experimental district has been in operation nearly two years. To those who have participated actively in its administration, the value of certain features appears to have been demonstrated very clearly:

I. *A Community Spirit can be Aroused.* It is shown that

(a) To the inhabitants of the district the work of the Health Department has become concrete; the district office is recognized as a place to which they can come for guidance in public health matters.

(b) Local civic organizations and public-spirited individuals are ready to aid the Health Department in developing a community health program. Private physicians, relief societies, neighborhood associations, educational alliances, public, parochial, and private schools, all coöperate in improving health conditions.

(c) A systematic health educational campaign by means of appropriate literature, exhibits, lectures and demonstrations will secure the attention of the people. The organization of clubs for boys, girls, parents, janitors, food dealers, et al., provides a very potent means of instruction with respect to health needs and requirements.

II. *Local Administration Gives Improved Service* as evidenced by the following:

(a) The health officer administers his health work to provide for the peculiar needs of the community under his direction. Furthermore, the field force is elastic; that is, it can be concentrated on infant welfare, school, infectious diseases, or other service as conditions or seasons of the year demand.

(b) Many local inter-bureau affairs can be adjusted directly at the district office. This gives a more satisfactory service to the people of the district and avoids the delay involved in referring these matters to general headquarters.

(c) The entire staff develops an interest in, and a knowledge of, the general health of the community. The family as the true unit of health work is emphasized, instead of some particular function, such as, supervision of tuberculosis or the care of the infant. The action and reaction upon all members of the family of deviation from normal health conditions is considered, as well as the relation of the family to its environment. Specialized functional administration limits the perspective of field workers.

(d) Nurses working together in a common field develop greater enthusiasm and interest in health work. Furthermore, nurses can be trained to perform satisfactorily an all-round health service. Upon this point there is a difference of opinion even among the administrative officers of our Department and probably this holds true of the experiments being conducted elsewhere. Unquestionably, concentration upon special functions results in special ability, but it is the opinion of the writer that we have over-specialized and that the amount of special technique lost in general service is more than counterbalanced by the broadening influence incidental to the consideration of all health conditions.

(e) Overlapping of service has been greatly reduced. This is especially apparent in the nursing service, where functions formerly performed by many nurses attached to different bureaus, are now done by a few nurses, each one being assigned to her own district in which she does all the visiting to the families therein. This has the further advantage of minimizing the annoyance consequent to many visits by many nurses to the same family. The following analysis of nurses' visits made during the first three months of the experiment shows the saving effected:

By staff of 3 nurses—2,280 visits in 1,475 houses.
In 991 houses, 1 health function was served at 1 visit
In 301 houses, 2 health functions were served at 1 visit
In 104 houses, 3 health functions were served at 1 visit
In 44 houses, 4 health functions were served at 1 visit
In 19 houses, 5 health functions were served at 1 visit
In 14 houses, 6 or more health functions were served at 1 visit
1,475—Total

(f) A greater amount of field service can be effected under the present system than under old conditions with the same force.

III. *Departmental Administration on a District Basis if Organized Properly Should Give an Improved Health Service to a Community.* This is true because

(a) Division of a city into districts with a health officer directing the activities of each district permits distribution of service according to local needs. Varying characteristics of different sections of the city, as shown by social distinctions, the nationalities of inhabitants, peculiar customs, type of dwellings, commercial districts and congested quarters demand varying methods of health administration.

(b) The district health officers being controlled through an administrative body at general headquarters are required to conform to policies and methods outlined to insure uniform execution of orders not purely local in character.

(c) Contrasting the district with others as to administration and results provokes health rivalry and acts as an incentive for improvement.

(d) Functional bureaus at headquarters are relieved of a vast number of petty administrative details of a purely local nature, which can be cared for as well through district officers. It thus gives to technical experts at general headquarters time to study and plan more advanced and new methods of administering health activities in their respective fields. Their development and execution can be directed by them through the district administrative officers.

(e) Planning and performance are recognized, as they should be, as separate functions. Planning the health activities is undertaken by qualified experts. The district officers, who should be chosen because of proven administrative ability, see that the work is performed. Too often under present methods of health administration an officer is required to both plan and perform his work, a task too large to secure best results for either function, and, furthermore, a combination of qualifications such as these is not often found in one individual.

(f) The district plan conforms to present tendencies in the field of general organization, to the principles of which we must refer, because health organization has not been recognized yet as a separate problem. The principles of "Line-and-Staff" organization, upon which all modern armies are based, are receiving increased consideration by industrial corporations and railroads in the administration of their affairs. This is the type of organization described in the health district plan. The members of the general staff are the technical experts who plan the work, and the line organization, performing the routine day-by-day duties, is represented in the district officers, each of whom controls his own force of field workers.

A pure "Line" organization, which is the one in use at present in most health departments, has many disadvantages, among which may be mentioned the tendency to become haphazard and autocratic, the burden of work and responsibility falling upon the field man, with resultant non-organization and great waste of effort. The great dangers in a pure "Staff" or "Functional" organization are bureaucratic administration, over-specialization, and overlapping of service with consequent duplication of effort. A "Line-and-Staff" organization tends to correct these defects.

The original plan of the experiment involved the coöperation of hospitals, dispensaries, relief societies and other agencies concerned with community health in order to develop a broad health program. Some of these features have been tried out but up to the present time the results secured are very incomplete and not sufficiently developed to warrant discussion at this time.

The present Commissioner of Health, Dr. Haven Emerson, has been so impressed with the results secured in the original health district, that he has ordered the extension of the experiment to the entire Borough of Queens, in which four health districts have been started, and plans are under way for applying it to other sections of our city.

DISCUSSION.

Mr. M. N. Baker, *of New York City:* It seems to me that in the majority of our cities and towns, while it is very desirable ultimately to broaden the field of health activities so as to take into account everything that may make for better public health, that for the present we ought to concentrate on those more obvious things, such as the suppression of communicable diseases and the reduction of infant mortality. I was somewhat impressed, in listening to the second of the papers just read, by the fact that, notwithstanding this intensive work which is being done in New York City, after all the greater part of the work outlined relates to these matters of contagious disease and infant mortality, or, to broaden that term, child welfare. What we all need to take into account continually is some measure of the work that we are trying to do and the results that we are accomplishing in terms of the money we are spending and for the present we certainly can do that best in connection with the two lines that I have mentioned. We should not rush forward too hastily in many of these general and broader things which we wish to do as soon as possible.

In regard to the second paper, it occurred to me, as it was being read, that the district plan for city work might, with immense advantage, be extended to apply more generally than it has yet been applied to state work. There is an immense waste due to sending inspectors and officials of one kind and another long distances over the state. In one state that is not very large, the practice has been, until recently, to send three or four different inspectors, only a few days apart, to look up quite similar lines of work. I think the district idea might be applied very advantageously to state as well as to local work.

Dr. J. S. Neff, *of Philadelphia:* Mr. Chairman, Ladies and Gentlemen: I consider Doctor Shipley's paper, although I may be prejudiced, one of the most important papers presented to this Section, as it must prove a great stimulus for efficiency in public health work. His data concerning Philadelphia are not quite accurate. Efforts had been made by the local health authorities about six years ago to procure budgets sufficient to create health centers along the same lines on which they have already been organized in other cities. Owing to failure in this endeavor, a few years ago, a private organization known as the "Child Federation" made an intensive study of a circumscribed district, established a health center, and maintained it in such a manner to make a practical demonstration to show the necessity of incorporating this character of work with the functions of the municipal department of health. Within the past year that center has practically been turned over to the city government and such has been its success that today, I am glad to say, there are four additional health centers in the city of Philadelphia, run entirely by the Health Department. The facts already deduced have proven, beyond question, that this method of public health administration is beyond the experimental stage, and there is no doubt in the world, from the results already obtained, that this is the ideal method for effective and efficient health administration in cities of large size, say of 200,000 population or over. The cost of maintenance is less under the health district plan than under the old methods, especially if you eliminate the cost of office rent. As the work is so much better done, efficiency increased to such an extent, that the results obtained are much greater. I mention the elimination of office rent for I believe the public school buildings should be used for this purpose, They have been erected at great cost and at present are used but one-quarter of the time. There is one very important phase of our work that has not been alluded to and I am informed is not employed in New York, namely, house to house visitation, irrespective of the existence of reportable disease. We take a district, block by block, and send the nurse into the home. I think it is very important that the nurse should speak the same language as the housewife. The nurse reports to the proper municipal departments, on the general sanitation of the home, the immediate surroundings, and teaches the social conditions, gives instruction on maintenance of hygienic conditions, how to purchase foods of the greatest nutrient value and at the smallest cost and how to prepare it for the table. When it is felt that the people can be relied upon to carry on the methods they have been taught, with occasional supervision, the work proceeds to the adjoining block, and the same method is carried on. This procedure makes the family the unit, complete records of which are kept in the health center through which the general executive health administration is kept in direct touch with every family in the city.

Dr. Heman Spalding, *of Chicago:* Mr. Chairman, Ladies and Gentlemen: I have jotted down a few things that I wish to call your attention to without argument. The desire of all health officers to get closer to the people has taken form in this attempt to establish health centers. I think the district plan is an advance in health administration. The plan should be tried in all large cities where the conditions render it feasible. I would have the health stations in a building designed for health work only. If you want to command respect, you must have a building that commands respect. Such a health station should have, first, a room for the display of health posters, spot maps and any other educational exhibits. This room should be used for an assembly room where lectures could be given with lantern slides, and also could be used for teaching little mothers' clubs which are so far-reaching in their effect. Second, a free dispensary should be provided for the treatment of defective children, children who have no means for securing a doctor. Third, a dental clinic should be established in this building for the same purpose. Fourth, the public bath should be located in this building. Fifth, the room for infant welfare should be provided for in this building. In this building we could have incubators for diphtheria cultures, which could be carried from a sub-station to the municipal laboratory. I would have this station under the supervision of a full-time health officer, who would have under his charge groups of health officers, field and school health officers, field and school nurses. Sanitary health officers, and food inspectors, could meet here also. At the present time in Chicago we have stations of that kind at the police stations, where the sanitary officer and the food officers meet, and, in coöperation with the police, are doing very well. All assignments of work I think should be made from the central office and daily reports of all transactions must be sent from the sub-station to the central office and a carbon copy of such reports retained for the use of the sub-station. This organization will cost more than the present method, and the men who furnish the money must be convinced of its feasibility. They must further be convinced that this plan will bring better results than the present plan. The character of the people will determine the size of the territory served by one station. I should say it would vary from 25,000 to 100,000 people for one station. Our present method does not reach the classes who swell the death-rate; we need a change. I understand we are to discuss Doctor Hastings' paper also, if we have time. Public health work is limited, first, by the amount of money provided for this work; second, by the intolerance of the public to new and advanced ideas; third, it has its natural limitations when the results obtained are of less value than the time and money spent. We must be practical and valuate our activities. Since we cannot put into operation all the schemes which it is known may save life, we must select such activities as will give the greatest results for the least expenditure of money and force.

D. F. E. **Fronczak**, *of Buffalo:* In relation to the paper, I would like to refer to the health centers in Buffalo, which, I believe, have been developed further than in any other city in the country. The health center is a miniature department of health, established in various parts of the city for the purpose of bringing the activities of the Health Department into intimate relationship with the needs of the people. It is not unlike a sub-station of the post office in relation to the general post office of a city, but with added functions. The first health center in Buffalo was established in 1914, in a district densely populated by some twelve different nationalities. Subsequently, in 1915, for the purpose of perfecting and extending the health center plan, a conference was held with representatives of all the social service working organizations in the city—the Charity Organization Society, the District Nursing Association, Milk Stations, Superintendent of the Poor, etc.—to the end that coöperation and uniformity of procedure between all should pertain, that extension of activities should attend, and that uniformity in keeping records for the prevention of duplication should ensue. I may say these records are now uniform and are exchanged daily.

At the present time, there are four health centers located in the four districts into which the city is divided, and they are located so as to be accessible to the needs of the population in each; and, additionally, there is maintained a central service for venereal disease, tuberculosis infections and mental disease, though within certain limitations this work also finds place in the health centers themselves. Each Buffalo health center is housed in a specially built and arranged building, and the scope of their work includes a well-baby clinic, and sick-baby clinic, a prenatal clinic, eye, ear and nose clinic, skin and throat clinic, free dental dispensary, medical clinic, etc.

I spoke yesterday at a symposium on venereal diseases and referred to the work in this field done by the health centers. Buffalo maintains a urologic hospital with outdoor service and indoor care and treatment, 48 beds—free to the poor—and every procedure in accordance with modern requirements including the Wassermann tests and salvarsan treatments, etc., is provided. The results, both curative and it is believed preventive, are very gratifying.

A supervision of midwives and their deliveries is another feature of great importance that is carried on. Every child in each district delivered by a midwife is visited by a public health nurse, and the condition of the child and the mother investigated, and with especial attention to the liability of ophthalmia neonatorum. During the past year, over 4,000 examinations of children born under these circumstances have been made and 226 children suffering from eye trouble have been either taken to the hospital or taken care of by our specialists in eye diseases without a single case of blindness or impairment of vision following. This work has attracted wide attention.

The Department's Bureau of Sanitation is engaged in making a complete survey of the city as to housing and relating conditions. One district of 3½ square miles, with a population of 25,000 people, has been completed. In addition to housing conditions, numerous other and surprising disclosures were made. Cases of concealed tuberculosis, venereal disease, insane and feeble-minded, truant children, prostitution, chronic alcoholic and drug addicts and a variety of similar conditions were unearthed, all of which were given prompt attention and have been properly disposed of according to established procedures. A city survey is of the highest importance and affords a basis for initiative work not obtainable otherwise.

Our experience so far shows that the health center plan is the one best adapted for meeting conditions. They bring the Health Department in close touch with the masses and favorable, they exert a desirable influence and reach fundamental conditions, alleviate sickness with promptness and accomplish a vast amount of preventive work not feasible ordinarily.

Doctor Shipley's paper is timely, interesting, and I am glad to have had the opportunity of hearing it.

Dr. J. F. McCrudden, *of Philadelphia:* Doctor Neff was entirely too modest in his discussion, as he neglected to state that he was primarily responsible for the health center movement in Philadelphia. In connection with this work, I have one suggestion to make to those who are about to take up health center work. Doctor Neff spoke of the house-to-house canvass. We have found this to be all important. We believe that in the house-to-house canvass we were enabled to more thoroughly accomplish our work of preventive medicine,—that for which the health center movement was primarily instituted. In Philadelphia, we also give much of our time and attention to a complete census of the neighborhood embracing the health center, and this, too, was of great help and assistance to us.

Another feature which we covered and which has not been spoken of by Doctor Shipley was the effort made to make the health center a community center. In view of the success of the health center proposition, it would seem to me to be only a matter of time when we will attempt through the health center to control the playgrounds and to make use of the schools for community entertaiments for the promulgation of health standards. Health center functions must eventually embrace the entertainment feature in the effort to promote interest in health principles.

Doctor Neff did not have time to state that we also conduct eye and dental clinics at these health centers, and in the one center in which the Child Federation coöperates with the city, we have accomplished extraordinary results.

Dr. G. W. Goler, *of Rochester:* I think there is no question but that the health center has come to stay. I only want to say a word in opposition to a statement made by Doctor Neff in which he says it is important that the nurse, who is the chief factor in health center work, should speak the language of the district in which she is doing her work. I believe it is important that they do not, and I will tell you the reason why. Some years ago, in talking to my friend, Lawrence Veiller, of New York, he said he was putting out a pamphlet and tried to put out as many pamphlets on the subject he was discussing as there were languages spoken in the district, until his funds ran out and it was practically impossible to continue; then he began an investigation and found that he was able to use the children in the various families as interpreters for the nurse. He said that when he went to a family of foreign-speaking citizens, the nurse would go in and what she said would be interpreted to the family through the children and the parents would stand with mouths wide open, and finally, in one case, the father jumped up and said "Ha, finee the boy, speakee the English like hell. Good stuff."

Doctor Shipley: The question was raised by Doctor Neff as to the practicability of the health district idea in relation to state health work. It is my feeling that this type of organization can be applied to both state and municipal health work. Among general organization experts and efficiency engineers, it is the opinion that Line-and-Staff organization is applicable to large communities, such as towns of over 100,000 or in districts covering a large area, such as one of the states. In small towns probably a pure line or a pure staff organization would be preferable.

We have in New York state an organization in which staff officers directed from Albany travel through their respective districts and instruct the local officers in best methods for performing their work. The line is represented by the local health officers who see that the work is done for their respective districts.

The house-to-house canvass in New York City has been applied to a limited extent so far as it relates to infant welfare work. We have not extended it as a broad proposition for that would require a large staff and with the limited funds allowed by the local municipal authorities, it is not a measure we can pursue at the present moment.

I agree thoroughly with the community center idea; in fact, I foresee its extension to the municipality as a whole. I myself have suggested to New York City municipal officials that eventually all the activities represented in the various municipal departments be segregated into districts and administered by what may be termed "District Mayors."

As a matter of fact, our big cities are overgrown small towns and the people have lost contact with the general affairs and we must turn to the local center idea in order to secure best results.

I am inclined to agree with Doctor Neff rather than with Doctor Goler that it is highly desirable that the nurse should be of the same nativity as the people in the district with whom she is working. That has been the experience in New York City, and Doctor Baker, Director of the Bureau of Child Hygiene, is continually trying to find nurses of the same nationality to go among the Italians and Poles, because we feel that the influence they exercise is much more than it would be through nurses of different nationalities.

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VENEREAL DISEASE IN CHRISTIANIA.

It is, perhaps, too much to hope, for the immediate future anyway, that our country will adopt any system of compulsory notification of venereal disease. Perhaps in time a city here and there will adopt it, and upon its success in such progressive communities will depend its extension to the nation at large. If some enthusiasts will brand us as ultraconservative in this matter, at least we have the support of the chief European powers in our attitude. Here and there, however, throughout the civilized world, countries are beginning to adopt measures looking to the safeguarding of their citizens from these insidious and prevalent dangers. Frequently we find the progressive offspring of a conservative parent welcoming such public health measures, as witness Australia. Then, to jump nearly the length of the globe, there is Christiania, which has been reporting venereal diseases since 1876.

In the report of the medical officer of health, Dr. Yngvar Ustvedt, for 1915, there are reported 2,424 new cases of venereal disease. This is more than twice as many as were reported in 1876, but since that year the population of Christiania has more than tripled. In other words, the percentage of venereal disease to the population had fallen from 1.28 to .96. The percentage of syphilis itself has fallen from .53 to .25 per cent. It is not probable, from what we know of lues, that these figures represent an actual decrease in the prevalence of the disease. It is more likely that with the advent of the Wassermann reaction and other diagnostic refinements many cases were definitely decided not to be syphilis, but chancroid or some skin disease. The day has gone by, we hope never to return, when the medical student learned two kinds of skin disease, eczema and syphilis, and every case was certain to be either one or the other.

Doctor Ustvedt's report mentions that during the year seven women were convicted in the courts of knowingly exposing others to the infection. It does not mention how many men were brought to trial who were directly responsible for complete hysterectomies.—*New York Medical Journal*, January 6.

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It is with profound regret that we have to announce the death of Dr. Henry D. Holton, who died February 12, 1917. Dr. Charles A. Caverly, President of the Vermont State Board of Health, elsewhere in this issue has kindly furnished a short biographical sketch of Dr. Holton's life. The following tribute is written by Dr. Peter H. Bryce, a life-long friend of Doctor Holton.

In Memoriam.

Physician, sanitarian, philanthropist, legislator, patriot!! Of none who has passed from our Association could these several words, expressing that *integer vitae* which Horace used to express a full-rounded life, be more appropriately said than of Dr. Henry D. Holton, not alone of Brattleboro and Vermont, but of the United States and, indeed, of the whole American continent, for which he labored so earnestly and with such fruitful results. A son of New England and of its Puritan founders, Doctor Holton grew up amongst its mountains, which have echoed for three centuries to the voices not alone of liberty, but of all the loftiest ideals and purposes of life; and there from boyhood to a ripe old age he labored unceasingly to make this old world upon which he looked so calmly and kindly better for his having lived in it.

Primarily devoted to his native state, the claims of his country in its greatest national crisis developed in him, as in so many others, a wide perspective, which first found its fuller scope when as a physician he tended the returned soldiers, who had fought for freedom and liberty. But fortunately for humanity, his active life was at the moment when modern science gave him the opportunity to play the splendid part not only of the accomplished physician, but also in that larger field of preventive medicine, which has accomplished so much for the public health of the world and not least of America. Doctor Holton's broad views of medicine not only led him to take an active part in the membership of many societies devoted to special phases of medical science, but also as early as 1873 led him to become a member of the American Public Health Association. Thereafter he urged the needs of State Medicine in Vermont many years before he saw his efforts rewarded in the establishment of the first State Board of Health.

His sense of public duty led him to take an active interest in public affairs, and first as a senator in 1884 and later as a member of the legislature, he not only seized the opportunity of learning legislative procedure, but also of obtaining that wide knowledge of public men, as well as the intimate acquaintance of such from all corners of his state, by means of which he was enabled to obtain public health legislation of a kind peculiarly suited to widely scattered settlements in a state with few urban centres. What he accomplished is common knowledge to the members of our Association; but the slow though sure steps taken, which led up not only to most complete executive supervision, but also to the evolution of one of the most active and efficient laboratories in any state, can only be known to one who has been fortunate enough to watch with friendly interest its development. Of the important part he played as member, treasurer, and later as president of the American Public Health Association, those who for years have been associated with him know best; and how during five years as Chairman of the Committee on JOURNAL, his enthusiasm, clear vision and generous financial assistance helped so powerfully to make the doubtful experiment of a monthly JOURNAL the success it is, can only be known to his colleagues in that work.

Of his personal qualities as a gentleman and friend the whole medical profession and many public men can amply testify; of the esteem in which he was held in his own community amongst whom he went out and in for half a century, the universal mourning of the fellow townsmen with whom he had so long held friendly counsel speaks eloquently. How he will long be missed by his intimate personal friends, those of us who were privileged to be amongst the number most acutely recognize; but we willingly though sorrowfully yield him to that final rest, which he has so well earned after his many labors are over.

THE NEW ORLEANS MEETING.

It has been decided that the New Orleans Annual Meeting of the American Pubiic Health Association will take place December 4–7, 1917. Members are requested to note these dates.

SCIENTIFIC MANAGEMENT AND ITS RELATION TO THE HEALTH OF THE WORKER.

Richard A. Feiss,
The Clothcraft Shops, Cleveland, Ohio.

Presented before the Section on Industrial Hygiene of the American Public Health Association, Cincinnati, Ohio, October 25, 1916.

SCIENTIFIC management, as the name suggests, applies the scientific method to all the activities of management. This means that the management assumes the responsibility for thorough investigation and procedure based on accurate knowledge. Not only are materials and equipment scientifically studied and methods for their use and up-keep established, but the human effort expended in their use must also be studied from the point of view of continuous up-keep. In fact, scientific management is the management of conservation. As such it must deal primarily with the conservation of human effort. This is true not only from the humanitarian point of view, but also from the economic. Taking the pure business aspect, there is nothing more profitable nor more essential.

2. In considering conservation of human effort the steadying of employment is of the greatest importance. The loss both to the management and to the worker through the constant change of personnel one finds in the ordinary industrial organization can hardly be conceived. It has often been estimated that the cost in dollars and cents of replacing an old employee by a new one amounts to anywhere from fifty to two hundred dollars. The loss to both the organization and the worker in effort, morale and efficiency, while less tangible, is far more important. A manufacturing concern in Detroit, employing fifteen hundred men, employed some thirteen thousand men, or over 800 per cent. of its total standing payroll from the spring of 1915 to the spring of 1916. A brass foundry in New England employing three thousand, employed during the first eight months eight thousand. The latter replacements would be at the rate of twelve thousand a year, or over 400 per cent. A large rubber concern in Ohio employing over ten thousand men and women is said to have a labor turnover of 150 per cent. At the Clothcraft Shops of The Joseph & Feiss Company an attempt has been made to approach this subject from the point of view of scientific management. The percentage of replacements during 1915 was 48 per cent., and for the first nine months of 1916 was no greater. This result comes from a realization of the importance of conservation of human effort, and of the fact that employment is not a mere matter of hiring and firing but, from the scientific viewpoint, is a matter of hiring and keeping.

3. For the purpose of scientific employment The Joseph & Feiss Company have established an Employment and Service Department. The

functions of this department are conducted from the point of view of keeping every position in the organization filled with fit men and women. The fitness of the worker involves primarily his health. It is apparent on the face of it that a worker under the handicap of even a minor ailment is going to suffer materially in his steadiness and efficiency. His health, therefore, must be conserved in the most scrupulous manner. For this purpose an adequate medical department is considered an essential part of the employment and service function. A medical examination is not only essential for the new employee but a periodical reëxamination and follow-up are also an integral part of the work. In this way alone can the results of the work upon the health of the worker be properly checked up and a course consistent with the best health of each individual worker be followed. Some of the details of this work and its effect have been touched upon elsewhere *

4. In connection with the health of the workers in industry, home conditions are of vital significance. No real educational or constructive work can be done without keeping this fact constantly in mind. The carrying of educational work into the home is of inestimable value. For a very capable description of this kind of work refer to an article entitled "The Relation of Home Conditions to Industrial Efficiency"† by Mary B. Gilson, Superintendent of the Service and Employment department of The Joseph & Feiss Company.

5. The poor health of a worker is commonly laid at the door of industry. Conditions contributing to the ill health of workers, however, are not inherent in industry, but are the result of unintelligent or unscientific management. While it is true that the conditions under which people work are responsible in some instances for ill health, a thorough investigation of the facts in each case would often disclose the ill health of the worker to be entirely due to personal habits or home conditions. It is common not only for the layman, but, also, for the physician to jump at conclusions in this matter. Physicians are often only too ready to lay the cause of an ailment to a man's work and to advise him, without any real investigation, to quit his job or not to work in a factory. It is very easy to make sweeping assertions as to factory work and to advise workers to leave their jobs on the slightest pretext of ill health, but professional men, above all, must realize not only the difference that exists between industries but also between various establishments in any one industry. The giving up of a job, even temporarily, is a matter of very great moment to the worker, and we question the right of any one assuming the responsibility of giving such advice without thorough investigation.

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* "Personal Relationship as a Basis of Scientific Management." A paper read by R. A. Feiss before the Society to Promote the Science of Management, Philadelphia, Pa., Oct. 23, 1915.

†Appearing in *The Annals* of the American Academy of Political and Social Science, Philadelphia, May, 1916. Publication No. 1009.

6. By reason of the tremendous increase in the productivity of the worker which results under scientific management it has been accused of injuring the health of the worker. Scientific management not only recognizes the basic value of continuity of employment and longevity of the worker, but represents the only scientific attempt to increase production through the conservation of his health and effort. Although this may be contrary to popular conception, scientific management, nevertheless, obtains increased individual output, not by drive, but by the elimination of waste.

7. It is erroneous to assume that speed affects the health of the worker. Speed in itself is not injurious. Under scientific management it is the result of improving conditions of work which under ordinary management tend to contribute to his ill health. There are conditions under which operating at half the best possible speed is more fatiguing and more injurious to the worker's health than operating at the best possible speed under proper conditions. As a matter of fact when conditions have been properly standardized and operations are taught by an adequate system of instruction, motions become reflex. It is well known that reflex motion is not only essential to the best possible speed, but requires a minimum of physical and mental exertion. We call your attention in this connection to the statement of the eminent psychologist, William James:*

"Habit simplifies the movements required to achieve a given result, makes them more accurate and diminishes fatigue."

8. The enormous saving of time effected under scientific management not only results in increased achievement, but also makes it possible and profitable to bring about that generally desirable end,—the shortening of hours. Greater achievement makes possible the payment of the higher wages of scientific management and at the same time the shortening of hours without increasing the cost of production. Fatigue is not only minimized by the reduction of the hours of work, but also by the conservation of effort while at work. Scientific management directly concerns itself with the elimination of all factors of fatigue. To quote from a recent work on fatigue study:†

"Even where fatigue is not materially cut down during working hours, because measurement shows that the worker is not getting overfatigued, the general health is apt to improve because of greater regularity in habits of work, and because of better physical and mental habits, while doing the work. The path along this line is a continuous, never-ending, upward spiral. Fatigue is eliminated by establishing proper habits. Proper habits improve health. The improved health allows of more work with less fatigue, etc."

9. Under scientific management not only the physical condition of the worker in relation to his work, but also

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*James, "Psychology," Vol. 1, p. 102.

†"Fatigue Study," by Frank S. and Lillian M. Gilbreth, p. 143. Sturgis & Walton Co., 1916.

the physical conditions under which he works are made subjects of scientific study. A study of proper ventilation, lighting and sanitation results in a direct effect upon the quality and quantity of his output. The management must not only assume the responsibility for standardizing and perfecting these physical surroundings, but all other conditions relating to the work before it can proceed with the standardization of the job itself with a view toward setting a fair task for the worker. Standardization of tools and equipment by means of time study and other research methods—of which the primary object is to eliminate unnecessary effort on the part of the worker—is an essential step in the increase of output. Materials also must be controlled by means of a proper routing system in order to insure an uninterrupted supply of work. By these means alone it is not uncommon under scientific management to effect an increase in output of 100 per cent. or more, while lessening rather than increasing the effort expended by the worker. Finally when time and motion study is applied to the job itself, the efforts of the worker are still further conserved by the elimination of wrong or unnecessary movements and by setting of a definite accomplishable task. No one realizes the amount of hopeless effort which is expended by the worker, nor the amount of time and output which is lost because of neglect of these important factors under irresponsible management.

10. Speaking of scientific management, Josephine Goldmark, in her exhaustive study on "Fatigue and Efficiency,"* says:

"The new organization of work has brought also a new emphasis upon the workers' physical surroundings. All those physical inconveniences which waste human strength and comfort and which are common rather than uncommon characteristics of our workshops,—such as bad air, bad light, overcrowding, dirt, and insanitary conditions,—are all marks of inefficiency in the management. They are intolerable to the system which is based essentially on the observation and study of cause and effect. Where the ordinary management sees in the crudest so-called 'welfare work' (better light, air, sanitation and comfort) merely concessions to the labor force, the engineer sees them as indispensable parts of the equipment. They are the mere commonplaces of efficiency, without which the accomplishment of predetermined tasks cannot be expected. . . .

"Scientific management obtains its marvelous results not only by teaching the worker the best possible way of accomplishing his task with the least time and effort, but also by removing all possible external obstacles. The management has, in advance, perfected his equipment and sees that it is always in perfect order and that the worker is regularly supplied with material in perfect order and condition. . . .

"One of the chief aims has been precisely to regulate the flow of work so that it shall be even and continuous. . . . Compared with such a régime, the crudity and chaos of ordinary systems stand out in glaring contrast. A revolution has been effected; a terrible waste has been checked, of that capital which alone is common and equal for all mortal beings: of time. . . . Hitherto hours, days and weeks of employment have been habitually lost to the workers through no fault of their own, but through the sheer incompetence of the management in performing its obligations and supplying materials and equipment fairly. No page in industry's history is more dreary and disheartening than the 'time lost' by competent and willing workers, waiting, unpaid, for employment which might be fairly regularized. Indeed, the daily delays and irregularities of work involve more than the direct loss of wage and earning capacity. They are more subtly interfused into the day's work; and the psychological gain which springs from the elimination of such daily annoyance and friction is undoubtedly an important factor in heightening working capacity under scientific management."

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*Pp. 201–202–203. Russell Sage Foundation.

11. This brings out another important factor relating to the health of the worker. The psychological result which springs from the elimination of daily annoyance and friction is, as Miss Goldmark states, of vast importance in heightening working capacity; but is of even more significance in its effect upon the health of the worker. Scientific management replaces the old system of bosses with its petty annoyances and injustices by a system of functional foremen who are responsible for the development and training of the worker in all of his various functions. This functionalizing implies the assumption of direct responsibility by the management for all conditions and activities, including the important one of personal relationship. This, as Miss Goldmark has said, assures to the worker the "elimination of daily annoyance and friction" of paramount importance both to his good spirits and his good health. In the words of the late Frederick W. Taylor, "More than all . . . close intimate coöperation and constant personal contact . . . will tend to diminish friction and discontent."*

12. Mr. Gantt† not only shows by graphic charts how the capacity of the workers is definitely increased under scientific management, but also points out a marked improvement in right habits of work, self-respect and good health. Too much stress cannot be laid upon the connection between mental and physical well-being. For this reason, alone, scientific management can be credited with being one of the most important forces contributing to the health of the worker.

13. Every one who has visited a plant where scientific management has been practiced for any length of time is immediately struck by the apparent good spirits and good health of the workers. If the individual records of the workers at the Clothcraft Shops of The Joseph & Feiss Company were investigated, they would reveal not only consistent evidence of good health, but also in the majority of cases a

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*"Principles of Scientific Management," p. 143. Harper Bros., New York.

†Gantt, H. L. "Work, Wages and Profits." Engineering Soc., 1911.

marked improvement. As evidence of the good effect of scientific management upon the health of the workers of this organization attention is called to the comparative stability of its working force as shown above. Although a large majority of the workers are women, over one-third have been in the continuous employ of this organization for a period of five years or more. During the year of 1915 with an average standing payroll of seven hundred sixty-two, the average daily absences for all causes amounted to less than seven and one-tenth persons, or about nine-tenths of one per cent.

14. Scientific management has as its object the maximum of prosperity for both management and worker. This object is attained not only by safeguarding, but also by directly contributing to the health of the worker.

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RED CROSS SEALS RAISED A MILLION.

Red Cross Christmas seals raised in the 1916 sale $1,000,000 for the tuberculosis campaign, according to the National Association for the Study and Prevention of Tuberculosis, which announced recently the results of the recent holiday campaign. All reports are not in, but carefully revised estimates of the few yet outstanding indicate that more than one hundred million seals were sold.

All the proceeds of the sale, amounting to a tax for health work of one cent on each person in the country except the insular possessions, are devoted to preventive tuberculosis work in the states and communities in which the seals are sold.

The National Association points with gratification to the fact that it realized its slogan "one seal for each inhabitant in the United States." Seals have been sold annually at the holiday season, beginning with 1908. They have been the means of raising a total of $4,206,051 for tuberculosis work. In addition to the thousands of tuberculosis beds which this sum has made possible, the seals have also aided in the establishment of hundreds of open-air schools, employment of thousands of tuberculosis visiting nurses, and have been an indirect cause of tremendous advances in the whole field of public health work.

Tuberculosis committees have been organized in practically every community of any size in the country. Every state in the union now has a state society engaged in state-wide anti-tuberculosis work. Hundreds of thousands of open windows, letting in unwonted quantities of fresh air to sleepers, may be traced directly to the public health educational effect of the Red Cross Christmas seals.

Last fall agents sold seals in every state and territory of the United States, except Guam, Tahiti and Samoa. Counting the school children, some 300,000 the total number of agents of the country approached 500,000. These included club women, school teachers, merchants, bankers, postmasters, and in fact, every kind of business man and woman.

The educational features of the seal campaign were developed in 1916 on a larger scale than ever before. School teachers received and read to their pupils one hundred and fifteen thousand story talks on tuberculosis. During Tuberculosis Week in December three hundred and fifty thousand pieces of educational literature, containing suggestions for sermons on tuberculosis and recommendations for medical examination of employees were distributed.

"Without the coöperation of the press of the country unstintedly given, as it always has been, these tremendous results from the Red Cross seal sale would have been impossible," said Dr. Charles J. Hatfield, Executive Secretary for the National Association, in making public the results of the sale. "Both directly and indirectly the newspapers of the country have, through the Red Cross Christmas seal sale, contributed to the alleviation of human suffering and to the total of human happiness, to a greater degree than any other single agency."

MODERN CHEMICAL INDUSTRIES AND PUBLIC HEALTH.

Francis E. Fronczak, A. M., M. D., LL. B.,
Health Commissioner of Buffalo, N. Y.

Presented before the Section on Industrial Hygiene of the American Public Health Association, Cincinnati, Ohio, October 26, 1916.

THE scope of these remarks are, by obligation, limited to a consideration of the relationship of certain chemical industries to the health of workmen and the interests of the public health in general, and are based on the inspection of seventeen plants, the processes being electrical.

No reference can be made to the establishments themselves or their particular methods and procedures. Authority for an inspection was made solely to ascertain what conditions in connection with the various processes of the industry related to the public health.

About twenty five-years ago, electrical energy began to be generated in sufficient amount to warrant its use in the industries, and soon thereafter, means were perfected to modify its intensity and quantity—in other words, to control and perfect its adaptability and safety. Among the first industries to which this new force of energy was applied was the chemical, in the manufacture of well-known substances such as chlorine, caustic soda, bleaching powder, chromates of potash and soda, chlorates, and metallic elements like sodium and phosphorus, etc. These substances had all been produced previously, but it was sought through the means of the new agent to produce them on a much greater scale and likewise more cheaply.

The deleterious conditions accompanying production throughout the industry, are due to dust, noxious gases and highly heated compounds. To speak minutely of the undesirable conditions found would be impracticable without making reference to the processes involved themselves.

Dusts are consequent upon the grinding of mineral ores and various other mechanical processes, and the character of most of them is irritating, some in high degree, and a few are corrosive.

In establishments properly and sufficiently equipped to provide for their disposition, there would be little evidence of their presence or their consequences. This, however, is not the case in the industry in question, for within almost all classes of buildings where these processes are carried on (although there were exceptions) evidence of insufficient protective measures were found in the presence of dust upon the floors, ledges, upon the fittings of the factory and in quantity, and likewise permeating the air. In one plant, the equipment installed for the removal of dust was so small and imperfect that it was necessary to shut off one part of the outfit to secure a degree of efficiency in the other. Further evidence of insufficient protective measures is found consequent upon their escape to the outer air, where the dust is wafted in clouds throughout the vicinity and deposited upon vegetation, buildings, fences and other structures coming within its action, with a resulting blighting and destructive effect.

Many gases of offensive and deleterious character and some possessing lethal qualities, are generated in quantities in almost all these chemical plants, and incident thereto, there is considerable leakage and permeation against the deleterious properties of which protective measures are not taken. On the contrary, they are purposely allowed to diffuse and escape to the outer air. As a matter of fact, buildings are purposely arranged so as to facilitate their escape in this manner, in order to bring about quick removal and dispersion, and in this manner, prevent or modify the consequences upon workmen. In one factory, an amount of actively poisonous gases arise without any sufficient device for protection, while in another, a very pungent gas escapes into the plant, one that is peculiarly irritating to the eyes and air passages, and all this without any attempt at control, although relief is said to be proposed.

In other of these industrials, noxious fumes like chlorine and dust like lime escape, sometimes in very small amounts, but under the various conditions of working and production, such as must naturally obtain in large industries of this character, the amount is generally large, contaminating the air of the neighborhood with the effect that what were once naturally attractive landscapes, are now converted into dusty, blasted, dreary wastes with a more or less smoky, gaseous, dusty atmosphere.

In some factories, certain mechanical processes are accompanied by a very high degree of noise, notwithstanding which, no protection whatever is made for protecting the ears of the workmen engaged in the work or of those in the immediate vicinity.

All these conditions are in consequence of the fact that the commercial end of production has minimized a proper consideration of the effect of deleterious substances escaping from the works, or the consequences of such escape have been entirely ignored and so much so has this been the case and so formidable have conditions become at times that the aid of the courts has had to be invoked to remedy the evil. In this connection, reference may be made to the fact that rapid advances, the development of new processes, the utilization of new methods, may have had their influence in deferring the adoption of protective measures.

No time need be taken in submitting evidence of the deleterious influences of these agencies upon the individual. In addition to experimental work and proof made in Europe, it is reasonable to assume that materials capable of exerting destructive action upon inanimate objects, are capable of exerting a likewise deleterious action upon individuals subject to their influence and such are the facts.

These dusts and gases exert their irritating influence upon the mucous membranes of the air passages and vary in intensity and effect in accordance with the particular chemical character or property, and one, at least, is so formidable as to produce ulcerations wherever the parts exposed to its action present conditions permitting entrance to the tissues or an accumulation.

Neither need time be taken in submitting evidence of their destructive effect on their surroundings, nor of their influence upon those who are obliged to live in the section. Their diffusion is the course of complaint and legal action, not only by such residents, but even by neighboring industrials themselves, some of whom are likewise offenders and the remark that "the other fellow" is at fault is quite current.

In considering the relation of these industrial establishments to the preventive equipment and measures required by the state law, it is to be noted that the law requires certain protective procedures and methods to be followed, presumably efficient and ample. In practice, however, they are found to be incomplete or inadequate, partly through want of skill in application, partly through difficulty in meeting the indication and not infrequently in that the installation is perfunctory, that to some extent establishments only attempt to comply with the requirements of the law and fall far short of the mark. In other words, compliance is, as stated, perfunctory and not in the spirit of the law. It is but right to state here that in general the attitude towards employees is the conservation of their health in the interest of efficiency and that it is becoming more appreciated that the well-being of workmen means efficiency.

In relation to the influence of conditions upon those engaged in the various occupations, an attempt was made to get some statistics as to the amount of poisoning or sickness caused by the work. The difficulty is obvious and the replies were general and not specific; in illustration—a medical attendant on some of these industries reports in relation to exposure from benzol "that such exposure in small amounts appears to improve the nutrition of the men, as the great bulk of workers put on a great deal of flesh after being in the work a few months, that chronic poisoning is occasionally observed and denoted by blueness of the nails and mucous membrane and a slight shortness of breath, with a decrease in hæmoglobin, but that removal to other parts of the plant is followed by recovery in a few days or weeks and that no permanent ill effects are observed. Benzol stills operated in the open air do not seem to exercise a deleterious effect, either acute or chronic, but when within buildings with a limited circulation of air they do, so it is endeavored at all times to get plenty of fresh air administered by large fans or blowers. Acute benzol poisoning is like a liquor intoxication and a further stage lethal, and all workers are warned to seek the open air as soon as they begin to feel exhilarated and one man is never put to work alone. Death from benzol is apparently due to acute pulmonary œdema, as large amounts of brown frothy fluid "are pumped from the lungs by the pulmotor."

"Chlorine fumes cause an intense bronchial irritation, with moist rales in the lungs; however, a few hours after quitting work, these disappear although an irritating cough is constant. In workmen exposed to chlorine gas, an increased tendency to pneumonia in extreme cold weather has been observed. Pulmonary phthsis is rare among these men. There are many workers here who have been in this line of work twenty-five years and their health compares favorably with workers in other lines."

All the factories visited claim their men are not injured by escaping products and point to the condition of some who have been with them for a long period of time.

The above are well-known generalities. However, in regard to the fact that some men are not injured or affected, it is to be noted that such is not evidence that all the men who have worked there have been free from the effects incident to the work, but only that the particular task of the long-time men or their possible idiosyncracy has kept them well. There may have been others who were seriously affected who have passed on to some other work somewhere else, where they can better stand the effects, but any record of them has not been kept or lost.

The prevention of damage from chemical work operated by electricity presents no problems which cannot be handled, and none that have not been satisfactorily solved abroad. It is only in this country where such industries have not been operated for so long a time, or where they are practically allowed to operate somewhat irrespective of consequences, that wholesale injury is present. In Great Britain and Continental Europe, there are stringent laws and constant efficient inspection to prevent outside injuries. This supervision and oversight began as long ago as 1863, and as indications arose, it was supplemented by further legislation in 1874 and 1881 and since that time. In relation to this supervision, the Encyclopedia Britannica, edition XI, volume 1, page 676, says: "There is hardly another example in the annals of legislative efforts equal to this, in respect to the real benefits incurred by it, both on the general public and on the manufacturers themselves."

This regulation of the chemical industry abroad comes under the direction of the Alkali Act and its inspectors are qualified men, having technical training and it operates under the provisions of the general government unaffiliated with local interests.

In relation to workmen in some establishments, applicants are subject to physical examination to determine their fitness for the work before employment.

All factories inspected were found provided with a proper first aid equipment which showed usage and some large establishments maintain a corps of physicians with one in constant attention.

In almost all places where workmen are subject to conditions indicating it, goggles for eye protection and helmets, some with oxygen supply, are worn.

In one establishment where, on account of its character, the condition of working men's teeth is important, a rigid system of dental examination and service is maintained. Every employee is obliged at an interval of three months, to be examined, and have necessary work attended to, all of which is during the time of and at the expense of the company. As a result of this protective measure, this concern claims to have absolutely eliminated the consequences incident to absorption of poisonous fumes through dental defects. Sanitary washing facilities are in evidence, and in many instances, shower baths were found installed. Metallic lockers are frequently provided though the ventilation of many locker apartments was often defective with the result that emanation from the clothing of hundreds and hundreds of workmen were in pronounced evidence.

In relation to the securing of proper conditions within the plant and the abatement of nuisance in the surroundings, there are, as stated, no problems that cannot be successfully handled. It is indicated that where mechanical processes are carried on with incident production of dust, the apartment should be air tight, the machinery of special protective design and that an efficient exhaust system be operative to carry off the dust for proper disposition, that in apartments where leakage of gas permeates, provision for removal be made in accordance with recognized principles; that gases and fumes escaping from reduction processes, etc., be likewise disposed of.

As to the best methods of securing such equipment and their proper operation, it would appear that the experience in other countries is significant. As long as supervision is vested in local authority, conflicting interests have their influence; therefore, it is my opinion that industries of this character should be under the supervision and control of the national government, under a commission or otherwise, whereby there will be a standard of comprehensive requirements with systematic supervision and inspection by men technically qualified for the purpose.

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MEDICAL CARE UNDER HEALTH INSURANCE.

How physicians, hospitals, and medical science will be brought more effectively to the service of the sick workers under universal health insurance is explained in a pamphlet just published on "Medical Organization Under Health Insurance" by Dr. Alexander Lambert, New York, Chairman of the Social Insurance Committee of the American Medical Association.

The full coöperation of physicians and public health officials, Dr. Lambert points out, is provided in the standard bill for health insurance prepared by the American Association for Labor Legislation and now before the legislatures of several states.

"In any large health insurance scheme," says Dr. Lambert, "a huge and intricate machinery is necessary and physicians are an essential part of this machinery. The service rendered by the medical profession must be on a business and not a charity basis. Sickness is an economic calamity for which the members of the community are responsible in varying degrees, and for which the whole community pays. The greatest economic asset that a workman possesses, is the health that enables him to go to work each day. If he loses that, he loses his power of earning his living."

The pamphlet covers thoroughly every aspect of the proposed system involving the medical provisions, with charts to illustrate the organization of medical care.

MUNITION-PLANT POISONS.

ARCHIE RICE,
International Steel and Ordnance Corporation, Parlin, N. J.

Presented before the Industrial Hygiene Section of the American Public Health Association, Cincinnati, Ohio, October 27, 1916.

THE European war has created unprecedented demands for the manufacture of several commodities that previously were little used.

Artillery, firing enormous quantities of explosive shells, requires that the bursting substance within the steel projectile shall be of such character that the tremendous concussion of the charge of powder in the cannon cannot make the departing shell explode.

None of the safety explosives thus used is really new. But their making and handling in Europe and the United States quickly developed into a huge war industry, employing, during a year's period, an aggregate, possibly, of one hundred thousand different individual men and women.

The possibility of the workmen becoming poisoned exists in the form of the fine dust and of the invisible vapor given off in the processes of manufacture and during the work of loading the projectiles with the bursting charge.

Either the dust or the vapor or both of them may be absorbed into the human system and get into the tissues through the pores of the skin, through the mucous membrane of the nostrils, of the mouth, and of the throat, and possibly through the lungs.

Russia, France, and the United States now use trinitrotoluol as a shell bursting charge. England uses trinitrotoluol and picric acid. Germany probably uses trinitrotoluol. And all of these countries use fulminate of mercury as the intensely powerful small agent to detonate the bursting charge itself when the shell strikes. A three-inch steel projectile approximately twelve inches long is made to burst into between one hundred and thirteen hundred ragged, flesh-tearing missiles.

Trinitrotoluol, picric acid, and fulminate of mercury are all nitro-substitution compounds.

These three and all other nitro compounds, except guncotton and nitrate of ammonia, are poisonous.

But after repeated absorption of small quantities of any of these poisons into his system the normal workman eventually becomes immune to that poison. For instance, a nitroglycerin worker daily absorbs a perceptible quantity of that oil into his body. He may bathe thoroughly in warm water, yet one, two, or three days later it may be possible to taste nitroglycerin on his skin.

All the nitro compounds have a faculty for accelerating the heart's action. Physicians frequently use nitroglycerin in small hyperdermic injections as a heart stimulant. Fulminate of mercury, a compound of nitric acid, alcohol, and mercury, is also a heart accelerator.

When professionally injected into the blood, these nitro compounds act directly on the heart, stimulating its beating. They also act on the heart when accidentally absorbed into the tissues of the body, but not so readily nor with the same power as when directly injected into the blood. Nature seems to combat the poison that enters through the skin and the mucous membrane. Efforts are made to get rid of it through the digestive tract and by the action of the liver.

Picric acid, which is a sort of chemical cousin to trinitrotoluol, is a nitro-carbolic acid. Because it acts more quickly it is more deadly than any of the other nitro compounds. This is because of the well-known characteristic of carbolic acid in its destruction of the mucous membranes of the mouth, throat, and stomach. And picric acid is more dangerous as an explosive, because it has the ability to change from a true acid to a metallic acid. For instance, if picric acid be allowed to fall on iron and remain there a few days it will be converted into picrates of iron, which is a very high explosive.

While more severe as a poison, picric acid is less dangerous to workmen because of its immediate disagreeable effects. It causes a puckeringly bitter taste in the mouth, a taste that persists for days. To avoid this bad taste workmen will keep their mouths shut and thus unconsciously protect themselves.

Trinitrotoluol is slower in being absorbed into the system, and it is slower in being thrown off by the action of the bowels and kidneys.

In its manufactured form trinitrotoluol is a fine yellow powdery substance somewhat like powdered mustard in appearance. In this condition it readily rises as factory dust.

Two methods are employed in loading it into high-explosive shells. By one process it is packed in dry. The more generally preferred practice is to melt it at ninety degrees Centigrade, converting it into a liquid that looks not unlike maple syrup, and then to pour it into the shell.

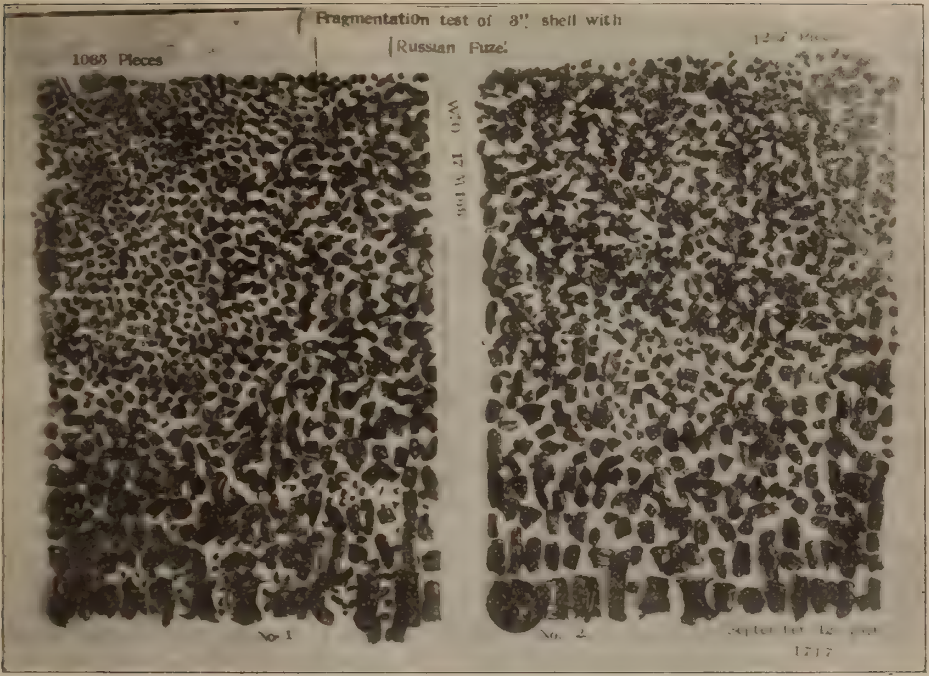
The dry method is all dust. The pouring process implies both dust and fume.

For eight months immediately preceding the 1916 convention of the American Public Health Association the writer of this paper has been a resident observer at a munition plant engaged in loading daily more than five thousand three-inch high-explosive projectiles with trinitrotoluol, using the pouring method.

During that period of eight months approximately five hundred different individual workmen came, by the nature of their employment, into regular manual and physical contact with both the dust and the fume of trinitrotoluol. Fifty of those workmen had to receive medical attention from a physician because of the effects of the trinitrotoluol upon them. Two of them died.

The experience of this one plant may be considered typical of what has probably happened in all the others, both in Europe and in the United States.

In the United States about three thousand men are regularly employed



The purpose of the safety explosive trinitrotoluol in a steel projectile is to burst the shell on contact half a mile to seven miles from the cannon, to rend into ragged fragments, any one of which will be more dangerous than a smooth rifle bullet. These fragments are showered in every direction, not a dozen but many hundreds of them. Trinitrotoluol at the moment of explosion emits a deadly gas if the place be underground and unventilated. The shells exploded in these two interesting examples were three inches in diameter, almost twelve inches long, and the steel alone weighed ten and a half pounds. The largest fragment is about twice as big as a door-knob, the smallest about the size of a rubber eraser end on a pencil.

in trinitrotoluol work in connection with munition contracts. But the newness of the industry and the popular fear of explosive factories as undesirable places of employment have tended to give the trinitrotoluol departments rather a transient class of labor such as is not generally trained or careful in hygienic habits. A large percentage of such men remain but a few weeks. So great is the tendency of this unsettled class to change that probably it is fair to assume that in a year's period as many as twenty thousand different men do some work in trinitrotoluol in the United States. Maybe twice that number of individuals are employed in trinitrotoluol work in Europe in a year.

The impermanence of the stay and of the residence of such workers has made it impossible to get a comprehensive record disassociated with effects produced by malaria, alcohol, and other agents.

One's first experience with imperceptible trinitrotoluol dust is a slight but distinctly noticeable bitter taste in the mouth. Longer exposure than the first casual experience is often followed by severe headache. There may also come an intense quinine-like bitterness in the mouth, persisting for perhaps twenty-four hours and accompanied by some headache and nausea, with white frothy vomitus. These are usually the effects upon the occasional visitor, with a later tendency toward a degree of immunity. Such was the personal experience of the present writer and of several other men similarly exposed.

Among the regular workmen there is an obvious yellowing of the exposed skin, so generally that many of the munition-plant workers are facetiously referred to as "canaries."

This yellowness is generally a dyeing process, and similarly is noticeable on workmen's clothes, gray cloth especially turning a dirty, streaky yellow wherever touched with the fine dust and then subjected to a moist atmosphere. And this dye is permanent in cloth.

But in its serious forms upon the system, trinitrotoluol generally follows a regular course. At first it accelerates the heart action when some of it has penetrated the tissues and reached the blood. Next there is a clogging-up of the pores, accompanied by strenuous efforts of the tissues to absorb the poison and to get rid of it through the digestive tracts. Then comes, with the clogged pores and the accelerated heart action, an increase in blood pressure, often accompanied by an obvious purpling of the lips.

Nearly all the medical cases showed some increase in blood pressure. Many of them showed an increased yellowness of the skin accompanied by a heavily coated tongue, indicating a liver condition and not a mere skin stain.

Neither of the fatal cases was at any time, except just before death, more serious than the worst of the others, all of whom recovered with ordinary medical care and a desire to coöperate.

One of the worst cases, verging almost upon death, was of a frail, tubercular workman who obeyed medical instructions and was attentively nursed by his wife. He returned to the trinitrotoluol work and thereafter wore one of the respirators provided by the company but rarely desired or used by the workmen.

Most all of the trinitrotoluol workmen happened to be between twenty and thirty years of age. One of those who died was aged twenty, the other aged twenty-three.

Both died of symptoms independently diagnosed by separated attending physicians as yellow atrophy of the liver. This is a disease so rare that few veteran physicians have ever seen a case. Of the few hundred cases on record about two-thirds have been women victims, and of the women victims one-fourth to one-third evolved the disease during pregnancy. It has always resulted fatally. Its cause has heretofore been unknown, but has been attributed to some vague poison, perhaps produced in the human system under certain rare conditions, and confined to persons between the ages of twenty and thirty.

At death both these trinitrotoluol victims had turned a uniform greenish yellow. All across their abdomens and chests were thickly distributed tiny pin-prick evidences of capillary hemorrhages just beneath the skin. The liver had, perceptibly to digital tapping, diminished in size. Unfortunately no autopsy was performed in either case.

The symptoms preceding these two fatalities were apparently in all respects identical with those of yellow atrophy of the liver. That rare disease has a course ranging within three weeks. First there is a period of general ill-feeling. Then come marked gastro-intestinal disturbances—griping pains across the abdomen—and the initial stages of jaundice. Next ensues a fever state. This is followed by delirium, with light-headedness and flighty utterances. That stage is followed by a state of coma lasting about twelve hours and ending in death.

A veteran authority on nitro explosives in the making has declared that while trinitrotoluol is poisonous it is deadly in its effects only when taken into a system using alcohol. If a workman will not drink alcoholic beverages, will bathe frequently, eat wholesome food, and take ordinary care of himself, there will be no serious results.

For the industry it is necessary that hoods and suction processes be maintained to draw off both dust and fume, that floors be kept clean, that there be abundant ventilation, that workmen be provided with overall suitings and protective gloves and with respirators, and that there be sanitary drinking fonts and hot and cold shower-baths convenient for the workmen. But, having provided such things, the company cannot compel the workmen to wash their hands before eating or to wear the respirators or to take the shower-baths. Nor can it exercise compulsion as to secret use of alcohol or neglectful personal habits such as make the human system less able to withstand any disease. But it can lay off for a day or so or shift to some other department men who begin to show signs of being affected by the poisonous dust.

At the plant to which particular notice has been given in this paper progressively improved safety methods were installed, and the condition of the working force steadily improved.

One man has worked continuously for eight months, daily handling trinitrotoluol barehanded and without wearing a respirator. And all the while this much-exposed workman has remained in robust health. But he takes good care of himself and does not drink.

One of the minor effects of contact with trinitrotoluol is a skin condition closely resembling that during an attack of poison ivy or of poison oak. The skin breaks out in blotches of tiny water blisters. Later it peels off in small flakes as after sunburn. For this condition of the skin magnesium carbonate in solution was applied with good results, generally effecting a cure in a few days.

All of this information would be of but transient interest if trinitrotoluol making and handling were probably to lapse after the war into a comparatively small industry. But it may grow in the United States to twice the magnitude of its war-time size.

Toluol is one of the numerous by-products of the refining of coal-tar. Wherever dyes are made in large quantities there toluol is also produced. And if dye-making attain large proportions in the United States and toluol become relatively cheap, then trinitrotoluol could be used to the extent of two hundred million pounds annually as a commercial explosive to be combined with nitroglycerin or with nitrate of potash. It could not be used alone in mine and tunnel work where ventilation is poor, as it emits at the moment of explosion a gas that would kill workmen in confined spaces. It has its value as a non-freezing dynamite and as a high explosive that is comparatively safe against shock and rough handling.

If it be extensively manufactured in the United States after the war, perhaps four thousand workmen would regularly be employed in the manufacture of trinitrotoluol.

The present trinitrotoluol industries in the United States are all in New Jersey, in adjacent eastern Pennsylvania and northern Delaware, in the northern part of Wisconsin, and in the central part of California.

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SOCIAL INSURANCE AND NURSES.

The *American Journal of Nursing*, February, in commenting editorially on an article appearing in the current issue of that *Journal*, takes the following stand:

"If we understand Miss Russell's paper on Health Insurance, the point which we, as nurses, need to take under careful consideration in the passing of such laws in the various states is whether or not we, as members of a profession, wish to be beneficiaries under such laws; that is, whether such nurses as earn habitually less than $1,200 a year shall be included among the groups for which provision is to be made. Such legislation would seem to apply to the great body of private duty and public health nurses, to those holding subordinate positions in institutions, to young physicians, and to the majority of public school teachers, as well as to the industrial wage earners for whom it is primarily intended.

"We know of no group of people who are more entitled to such aid than nurses, for whether they are working in the proper spirit or not, their work is for the health of the community, and so far as we understand the intention of these laws, we believe that all public health workers whose salaries are inadequate should be beneficiaries. In the apportioning of the premiums to be paid, two-fifths by the employer, two-fifths by the employee, and one-fifth by the state, the difficulty of regulating the employer's fee, in the case of the private duty nurse, at once presents itself as a problem, but one which will have to be worked out. Similar problems have already been worked out in England in regard to both doctors and nurses but, we understand, not entirely to their satisfaction."

THE DANGERS CONNECTED WITH THE SPRAY METHOD OF FINISHING AND DECORATING.

DR. R. P. ALBAUGH,
Acting Director, Division of Industrial Hygiene, Ohio State Department of Health.

Presented before the Industrial Hygiene Section of the American Public Health Association, Cincinnati, Ohio, October 27, 1916.

THE spray method of applying varnishes, enamels, shellacs, lacquers, and practically every kind of finishing and decorating material brings with it the increased dangers of poisoning by the various hydro-carbons that are almost constantly used for quick drying and even spreading, as well as lead and other poisons used in the composition of the substances applied, unless unusual precautions are taken against the inhalation of these products by workers. The spray, or compressed air system, is gradually supplanting the old method of dipping and brushing, resulting in a better quality of work, greater speed and economy, a higher degree of efficiency, and, when properly equipped and operated, a greater degree of freedom from occupational poisoning should result. Unfortunately, during the period of development of the spray method, all effort was devoted toward perfecting the nebulizer in order to turn out a better finished product, while little or no effort was directed toward the removal of nebulous clouds of poisonous fumes and vapors which enveloped the person of the operator. As a result, we have seen a number of cases of poisoning by naphtha, lead, etc., in operators of these machines, and a number of others have been reported to us.

On September 13, 1915, our attention was called to the death of a youth the previous day, the cause of death being assigned as "Myocardial degeneration, probably caused by naphtha and turpentine poisoning." We called on the physician having charge of the case, who stated that the patient had first consulted him at his office six days previously. He gave his age as eighteen, single, American, and occupation as a sprayer in a filler and varnish room in a factory. He complained at that time of great weakness, periods of nausea, loss of appetite, tingling of extremities, constipation, and hemorrhagic spots over the body. He was very anemic and had lost about eighteen pounds in the past six months. The systolic blood-pressure was found to be 85, temperature 97.2 and pulse 69—weak and irregular.

On the second day thereafter the patient was compelled to take to his bed with the above symptoms exaggerated. The systolic blood-pressure was found to be only 75, the temperature below 94 (it could not be recorded accurately because the thermometer was graded down only to 94), pulse 90 and very weak and irregular. The urine was rather cloudy, specific gravity 1.022, acid in reaction, contained a trace of albumin, many hyalin casts, a few finely granular casts, and a few cylindroids. Blood count: Erythrocytes, 3,500,000; leucocytes, 12,400; polymorphonuclears, 78.6 per cent.; small mononuclears, 16.4 per cent.; large mononuclears, 3 per cent.; and eosinophiles, 2 per cent. Spinal puncture revealed nothing. His condition grew steadily worse and on the fifth day he passed into a delirium and died the following day. An autopsy was refused.

On the occasion of one visit by the physician to the patient's home, he encountered three young men who came to visit the patient, and who were employed in the same department with him. They all described symptoms very similar to those of the patient, except in a milder form, and signified their intention of leaving the establishment.

As is customary in such instances, we called at the establishment where the patient had been employed and learned that for eight months he had been a sprayer in the varnish room. Each sprayer was covered by a large hood or cabinet of sufficient size to allow the presence of the article to be varnished and, indeed, the person of the operator, should he so choose. Each hood was equipped with an exhaust pipe with good exhaust. However, when the spray was directed against a flat surface, it would roll back and completely envelop the upper part of the operator's person, particularly if he were not careful of his position. It was observed that the workers paid little attention to being included in the escaping spray at frequent intervals, although such was not apparently necessary to perform the work. It was stated that a substance was used which contained naphtha and there was a very perceptible odor of "quick driers" present, suggestive of a turpentine and benzine combination. No respirators were worn nor were any adequate instructions given or enforced supervision concerning the exposure to the spray.

There are approximately 2,500 sprayers in use in Ohio and in only about 25 per cent. of them have the necessary precautions been taken to safeguard the health of the operators. The more common faults and imperfections which we have found are noted below:

1. Cabinet provided but exhaust absent or insufficient.
2. Good exhaust, but cabinet too shallow.
3. Good exhaust but poorly located in box.
4. Fan located too far from box.
5. Exhaust inlet too small.
6. Pipe occluded by accumulations of paint, varnish, etc.
7. Cabinet with flat back or top where exhaust inlet is located. It should be conical to provide uniform draft.
8. Tendency to apply spray at right angle to flat surface, causing it to roll back, enveloping operator.
9. Necessity, in spraying long objects, of getting out of range of the exhaust.
10. Inclination on part of workers to enter cabinet and sit on stand while spraying in order to rest after constant standing.

11. Ignorance of the presence of poison and dangerous character of the work.

12. Spraying promiscuously about the work room away from the exhaust box, as in "touching up" or trying the sprayer, etc.

13. Defective vision of operator.

14. Poor illumination of work space.

As the spray method of applying fillings, varnishes, colors and paints, dissolved in various hydrocarbons for quick drying and even spreading, is becoming very extensively used, especially in factory work, and as the fine nebular clouds produced give opportunity for unusual diffusion of the volatile substances present, nearly all of which are poisonous, employers should adopt unusual precautions against the inhalation of these products by workers. The installation of confining cabinets, exhaust pipes, etc., is not sufficient. The workers themselves must be strictly supervised in their work and their tendency to expose themselves to the spray. Undoubtedly many cases of increasing fatigue and exhaustion have developed among this class of workers, causing most of them to quit the employment. On the other hand, some who have remained have passed into the purpuric and later moribund condition here described, with fatal consequences.

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NOSTRUM ADVERTISING AND THE AGENCY LEVERAGE.

The ramifications of the fraudulent "patent medicine" business are many. The acceptance of advertising from such concerns by small country newspapers is not always an indication of a low ethical standard of advertising, at least not wholly so. One of the developments of modern business is the advertising agency, to which many concerns, instead of attempting to handle their own contracts, turn over their advertising business. These agencies place the advertisements in such publications as their special knowledge and judgment suggest will bring the best returns to their clients. Large agencies, having the power of dispensing advertising largess, naturally possess no little influence with publishers. Supposing, then, that the manager of a large agency is financially interested in a fraudulent "patent medicine" business whose advertising he handles—and there are some such cases. Suppose, further, that he submits an advertisement of the nostrum in which he is interested to a country newspaper publisher who tries to keep his advertising pages clean. If this country publisher rejects the "patent medicine" copy, he puts himself in the position of offending a man who has the power to send to him, or withhold from him, much reputable advertising business during the course of the year. As one of the big advertisers of the country has said: "Naturally publishers—particularly the little fellows—hesitate to offend a concern which sends them so much business even though they hate to accept this particular kind of advertising." When next you feel like "jumping on" the publisher of your local paper because of some particularly flagrant nostrum advertisement, find, out before you do so just how much economic pressure is being exerted, directly or indirectly to make him accept such advertising—*Journal of the American Medical Association*, February 3, 1917.

FACTS AND FALLACIES IN DISINFECTION.

Herbert C. Hamilton,
From the Research Laboratory of Parke Davis & Co.

Read before the Laboratory Section of the American Public Health Association Cincinnati, Ohio, Oct. 26, 1916.

ONE of the most important problems confronting the well informed health officer is that of cleaning up or preventing infection. Whatever measures he takes, these should be supplemented by an intelligent use of some chemical disinfectant. What shall he use? A new substance is proposed and gains a certain degree of popularity only to be relegated to a secondary place in favor of one still newer. One is likely to lose sight of the virtues of the older disinfectants in this maze of new products.

It is advisable to glance over the field occasionally to discover the advantages and disadvantages of these various substances; for while few are valueless only the best for the specific purpose is to be recommended.

A disinfectant is often overrated because in the hands of a careful user exceptionally good results were obtained. Some are discredited because of being used under improper or inappropriate conditions. Almost any substance may, under certain conditions, appear to be a disinfectant when in reality the conditions and not the substance were unfavorable to the development of the organisms.

If bacteria are transplanted from contact with a substance which reduced their vitality, to a culture medium slightly unfavorable for growth, an erroneous impression will often be obtained as to the germicidal value of the substance in question.

This actually occurred in testing a well known protein compound of silver which in a medium regularly adjusted by addition of hydrochloric acid to an acidity of 1.5, gave a phenol coefficient of 5 while in an unadjusted medium with acidity of 0.8 the coefficient fell to about .5 to 1. (See Protocol 1, Appendix.)

Another occasion for the discredit of a good disinfectant is the erroneous idea in the lay mind that a disinfectant is an insecticide. Formaldehyde fails as a fumigant for destroying insect life, a fact which may partly explain the appearance of adverse reports. (See Protocol 2, Appendix.)

The more probable reason, however, for the often expressed disparagement of formaldehyde is an improper use largely because of a misconception of its properties. Dry formaldehyde gas while exceedingly irritating to mucous membrane is almost innocuous to bacteria, the germicidal value being brought out only when in aqueous solution, or probably by the hydrate. It readily polymerizes, so that if slowly generated with insufficient moisture present, the active hydrate is not produced in a proportion to be efficient. (See Protocol 3, Appendix.)

Various improper methods have

been proposed and applied for generating the gas from its aqueous solution. Potassium permanganate or chromate by combining with a portion of the agent generates sufficient heat to volatilize the remainder with the necessary water, the amount destroyed not exceeding 20 to 30 per cent. of the original content, while the rapidity and completeness of evolution both of formaldehyde gas and water vapor more than offset the necessary loss.

When lime is used as the heating agent only the heat of combination with water can be permitted, since the lime-water slowly but almost completely destroys the aldehyde forming inert decomposition compounds. The same is true of caustic soda which is the reagent employed in one or more commercially exploited generators. It is also essentially true if calcium hypochlorite is so employed.

A prompt and more or less violent reaction occurs when a 40 per cent. aqueous solution of formaldehyde is mixed with any one of the above named reagents, but careful experiments failed to find effective quantities of formaldehyde among the evolved gases.

The method employed to determine the amount evolved was essentially that described by Frankforter (J. A. C. S., Vol. 28, 1906, p. 1234) the gases being absorbed by an excess of distilled water. By this method 30 per cent. of the theoretical quantity of gas was found to be liberated from a solution by means of potassium permanganate, while only 3 per cent. could be found when caustic soda was the reagent used. Lime is more efficient than caustic soda because a higher degree of heat is evolved in the reaction. Chlorinated lime under the same conditions appeared to evolve only chlorine compounds, no formaldehyde gas being detected in the aqueous solution collected.

Any rapid method by which the unchanged formaldehyde gas can be driven off from its aqueous solution is more or less satisfactory as a means of disinfecting a room by fumigation.

Formaldehyde gas, however, is so volatile that it must be almost immediately redissolved in water vapor or it will be dissipated before an effective strength is obtained. Therefore there are three highly essential factors in a successful fumigation with formaldehyde, namely, very rapid evolution of gas, a percentage of moisture in the air approaching saturation and absence of air currents. It follows that disinfection should not be attempted on a windy day, that the air must be rendered moist by sprinkling the floor with water about fifteen minutes before fumigation and if possible that a permanganate or chromate salt be used to develop the requisite heat.

Calcium hypochlorite or bleaching powder is one of the very few substances which spontaneously evolves an efficient disinfecting vapor.

The gas first released is chlorine which has a very caustic action on fabrics, colors and metals, and is therefore objectionable in most cases.

Hydrogen peroxide has had a varied reputation. Reputed very highly by some, it is considered worthless by others. It all depends on the point of view and the way in which it is used.

With a phenol coefficient of .03 it is as strong as a 3 per cent. solution of phenol and therefore theoretically capable of destroying almost all infectious organisms. Practically, however, it is so rapidly destroyed in contact with organic matter that no great dependence can be placed on it as a disinfectant unless used repeatedly in considerable quantities. It has a value, however, all out of proportion to its germicidal action, in that as an active oxylizing reagent, the evolved gas acts as a cleansing agent, the foreign matter in wounds being extruded in a very efficient manner. It is therefore active in proportion to its hydrogen dioxide content but not primarily as to its phenol coefficient.

Much difference of opinion exists regarding the value of soap as a disinfectant. Tested against bacteria by any of the quasi-official methods a pure, neutral soap has little germicidal action in any practicable strength of solution. A 5 per cent. solution of most soaps is efficient in killing all non-spore-bearing bacteria in a few minutes but this is not a practicable solution to obtain except with soft soap.

Many soaps, however, are not neutral but decidedly alkaline and to this ingredient undoubtedly some of the relatively high values may be attributed. (See Protocol 4, Appendix.) A neutral soap or preferably one that is slightly alkaline is indirectly valuable because of its cleansing properties, particularly in its action to remove the protecting fatty film on the skin and allow penetration of an active agent. Theoretically a true disinfectant associated with soap is an ideal combination for cleansing and disinfecting the hands and the site of an operation. Practically, however, few of the disinfectants with which we are familiar can be advantageously used with soap either because of the physical properties of the resulting mixture or of chemical reactions impairing the quality of one or both of the two agents. Symes investigating this subject (Antiseptic and Disinfectant Properties of Soap, 1909) found that a 1 per cent. solution of soap—as strong as an average solution can be made—kills some bacteria in ten minutes, but most are not killed after hours of exposure, which is also true even of a 5 per cent. solution. He also found that no added disinfectant greatly enhanced the value of soap except biniodide of mercury which was very effective for disinfecting instruments and the field of an operation. Plain soap is germicidal toward some bacteria, notably B. *typhosus*. My own experiments (See Protocol 5, Appendix) have demonstrated that the different glycerides produce soaps which differ in their germicidal values, but that no soap can be considered an effective disinfectant unless associated with some other more active agent. The substitution of scrubbing with soap for fumigation in terminal disinfection is not a safe practice. The cleaning is to be commended but is not a substitute; it is only an aid to disinfection with a fumigant.

Ethyl alcohol is very largely used as a disinfectant for the site of an operation or injection, but by many it is regarded as of little value. It is generally considered that only the medium strengths of alcohol are active.

Experiments recently carried out verify the results obtained by Harrington and Walker (*Boston Medical and Surgical Journal*, Vol. 148, p. 548) (See Protocol 6, Appendix), who found that "unless the bacterial envelope contains a certain amount of moisture it is impervious to strong alcohol; but dried bacteria in contact with dilute alcohol containing from 30 to 60 per cent. of water will absorb the necessary amount of water therefrom very quickly, and then the alcohol itself can reach the cell protoplasm and destroy it."

It is evident, therefore, that sponging the site of an operation with alcohol after scrubbing with soap is a safe procedure; adding acetone to the alcohol is logical as a fat solvent and is quite commonly practiced. A further aid to disinfection is the addition of 1 to 2 per cent. of a high coefficient coal tar disinfectant to the acetone-alcohol mixture by which one can obtain a sterilizing solution equivalent to 40 per cent. phenol. (*Journal of Surgery, Gynecology and Obstetrics*, Vol. 21, p. 85.) Such a solution is neither poisonous nor irritating except when the hands are encased in rubber gloves after being treated with the mixture.

The high coefficient disinfectants of coal tar origin have several factors to contend with in finding a satisfactory position among the known germicidal agents. There is doubt as to the high values assigned to them on the basis of a laboratory test, especially since many coal tar products have been proved to be almost worthless. While it is true that no ideal method of standardization of disinfectants has been evolved many of the variable factors have been discovered and eliminated, so that there is reason to hope that germicidal agents may some day be as accurately graded as other chemical substances. The tests applied are relative, however, and there is little reason to suppose that a substance found by a careful laboratory test to be 2, 5, or 20 times as efficient as another similar substance would not be found in practice to have the same relative value when used under similar conditions. If the standard is of the same character and the conditions are the same the statement could not be questioned. Unfortunately the standard used for comparison is, although technically similar, actually decidedly different in many respects. Pure phenol has been chosen as the standard with which to measure the activity of all classes of disinfectants, and, while it belongs to the same series as the other phenols of coal tar, there are many conditions which change the resistance of the test organism toward everything but the standard. This is a generally recognized fact and is a serious defect.

On the other hand, the conditions imposed on the laboratory test are sufficiently severe as to eliminate most of these variants.

Another defect in the method of grading disinfectants by their phenol coefficients is the fact that different organisms have a ratio of resistance different from that of B. *typhosus*—the standard test organism. With some organisms the values of disinfectants is higher and with others lower than their present rating. (See Protocol 7, Appendix.) Because of this and other factors involved, the Bureau of Animal Industry has felt compelled to reject all but pharmacopœial germicides for disinfecting premises possibly infected by hog cholera, foot and mouth, and other infectious diseases. This has made necessary the use of the relatively expensive cresylic acid, practically all of which is imported, while thousands of gallons of disinfectants from coal tar distillates of local production are barred from official use. This is a hardship because of the relatively high cost of the imported cresylic acid and is economically unwise because of its relatively low germicidal value. When properly carried out the germicidal test which establishes the phenol coefficient is of more value than a chemical test which compares phenol content only and takes no cognizance of the difference in character of the different classes of phenols. (See Protocol 8, Appendix.)

In connection with the policy of the Department of Agriculture in recommending disinfectants, a point is worthy of notice that lime is recommended to be mixed with the solution of phenol or of cresol compound in the proportion of not to exceed 1½ pounds to 1 gallon of solution. There is unfortunately no express instruction to use fresh water-slaked lime which would have a degree of germicidal value in itself. The lime compounds of phenol and cresol have about one half the germicidal values of the uncombined substances. While the lime mixed with cresol compound not only lowers the value of the cresylic acid, but is itself partly neutralized by the soap, forming a sticky inert lime soap. Such a practice, while intended for the good purpose of showing where the disinfectant has been applied, would appear to do more harm than good unless as noted above the lime used is fresh stone lime. In that case the freshly slaked lime would be of more value than the combined phenols. (Protocol 9 and 10, Appendix.)

Freshly prepared calcium hydroxide has a coefficient of approximately 20 based on the fresh lime used. (Protocol 11.) It is highly efficient theoretically, but as a practical disinfectant has only a limited application, because of its insolubility, instability and because of the residue wherever applied.

The effect of lime and magnesia as they often occur in the diluting water for coal tar disinfectants and dip is of considerable importance in that the emulsifying agent or solvent is in most cases soap. One part of lime combines with 12 parts of soap forming an insoluble grease no longer capable of emulsifying or dissolving a saponaceous disinfectant. Without this constituent the active agent is no longer in a finely divided state capable of acting uniformly but separates in a layer of oil which often causes considerable damage by reason of its corrosive character in this condition. Such a water should be corrected by the use of washing soda or caustic soda. When properly treated with one or both of these ingredients the water can be safely used as a diluent for any of the coal tar dips or disinfectants.

The comparative values of an emulsifiable and a soluble disinfectant is a question that seems entirely profitless. It has nevertheless been claimed (Chick & Martin, *Journal of Hygiene*, 1908, Vol. 8, p. 654) that the former is the more efficient since the finely divided particles of the oil were observed to have a Brownian movement and, in effect, to bombard the bacteria.

Laboratory experiments fail to verify this hypothesis. These were carried out by using cresylic acid and soap, the ratio between the two being varied to obtain in the one case a complete solution, in the other with less soap a hazy emulsion. Careful tests of these two preparations failed to show any material difference. (See Protocol 12, Appendix.)

Another point in connection with coal tar disinfectants is the effect of exposure to light.

That this effect is to lower the efficiency is the statement made by Prof. Charles E. Higgins of Ottawa (personal communication) who found a marked decrease in germicidal activity in several samples so exposed for three weeks.

To verify this statement a sample was divided, one part remaining in an amber bottle, the other in a small clear glass bottle exposed to the light, partly direct sunlight.

After one month this was found to have lost about 8 per cent. of its activity as compared with the other part. This is not a negligible loss. It is one that should be guarded against by avoiding undue exposure of disinfectants, especially the sample for assay representing a bulk lot. It may well be that this is, in part, the explanation of disagreements in reports from different tests of the same preparation.

The actual loss, however, is insignificant and is offset by the fact that recommended dilutions are usually much lower than the efficiency of the preparation would permit. (See Protocol 13, Appendix.)

One occasionally wonders what combination of circumstances is responsible for the appearance and retention on the market of certain disinfectants for which high values are claimed and which uniformly fail to show these high values by any of the accepted tests. In the case of one product of this character it is claimed to be ten times as efficient as phenol while careful tests show a value only slightly in excess of that of phenol. The active constituent appears to be B-naphtol dissolved in glycerine. (See Protocol 14, Appendix.)

Another instance of a product less valuable in general than would be justified by the claims is one which has the recommendation of the hygienic laboratory. It is even called the Hygienic Laboratory Pine Oil Disinfectant. It is prepared from a specially distilled pine oil and the impression is given that any oil so prepared is equally valuable. It is described as if it were a new product, while as a matter of fact similar preparations have been on the market for years. Tests are shown (Public Health Report, October 8, 1915) on which a coefficient of 5 is claimed and a dilution of 1 in 500 recommended for general use while this same dilution acting on a filtered suspension of B. *typhosus* failed to kill in 15 minutes' exposure. (See Protocol 15, Appendix.)

As an evidence of the possible harm done by such a publication a sample of disinfectant prepared in North Carolina from an oil supposed to be identical with the specifications had a coefficient of 0.5. (See Protocol 16, Appendix.) This producer was justified in expecting a coefficient ten times as high as his product actually possessed and on the basis of the statement below would be justified in marketing his product and quoting as follows:

(PUBLIC HEALTH REPORTS, OCT. 8, 1915.)

"The new preparation is derived from pine oil, a by-product in the manufacture of turpentine. It is easily prepared by mixing certain portions of the oil with rosin and sodium hydroxide solution, the finished product being a reddish-brown liquid, rather thick and oily in appearance, but free from turbidity. With water it makes a perfectly white emulsion, much resembling milk. It has a pleasing odor, no objectionable taste, and attacks neither fabrics nor metals. It possesses over four times the disinfectant properties of carbolic acid and is altogether non-toxic, so that it may safely be used as a throat spray or mouth wash in solutions of the ordinary strength. The cost of the preparation is remarkably low, as it can be manufactured for less than fifty cents a gallon, solely from products which are produced in this country.

"It is believed that this new compound, which is to be known as "Hygienic Laboratory Pine-Oil Disinfectant," will become one of the most useful preparations of that character. Fortunately the high cost of the oil has prevented the flooding of the market with this low grade disinfectant."

A brighter picture is presented by Dakin who brought into use a valuable form of hypochlorite. While the solution Eusol and the powder Eupad suggested by him have no extraordinary values, the toluene derivative, Chloramine T, has properties which commend it to our attention. No extended examination has been made to determine its general applicability, but germicidal assays by the accepted methods show its value to be 50. (See Protocol 17, Appendix.) The presence of organic matter materially lowers this value, but when used as suggested by Dakin, it is probably a safe disinfectant.

On many occasions there is need for a preservative agent to prevent the bacterial decomposition of solutions of organic substances or drug and glandular extracts. While ethyl alcohol is more or less ideal for this purpose, in some cases it is not applicable either because of its action on an active ingredient or because of its effect on the patient.

Certain of the phenols derived from coal tar are made use of, especially in antitoxin. Where those commonly used are not applicable because of the irritation to tissues, other phenols from high coefficient oil can be substituted to advantage. Their low toxicity, freedom from irritation and high antiseptic values all tending to make them very valuable. (Protocol 18.)

Another substance applicable for this purpose is Chloretone—trichlor-tertiary-butyl alcohol. A saturated solution—about 0.8 per cent.—kills B. *typhosus* after two minutes. It is less effective against spores and moulds but is almost universally applicable against bacterial decomposition. (Protocol 19.)

When the bacteriologists discovered that certain dyes have a specific staining action on bacteria it was the first step toward applying these dyes as germicidal or at least antiseptic agents. There seems to be no relation between color and germicidal activity but, regardless of color, the acid dyes appear to be inert and the basic, active.

No exhaustive experiments have been made to determine the value of these substances as disinfectants but experiments carried out by Churchman (*Journal Experimental Medicine*, Vol. 16, 1912, p. 221), Russell (Same Journal, Vol. 20, 1914, p. 545) Hill and Tabor (*Journal Infectious Diseases*, Vol. 15, 1914, p. 566) show a high degree of antiseptic value.

The low toxicity and freedom from irritation of some of the promising dye products lead to some experiments which showed that in vitro methyl violet has a phenol coefficient of 200 against Bact. *diphtheriœ*. Other dyes, gentian violet, malachite green, methylene blue, showed toward Bact. *diphtheria* and B. *typhosus* no remarkable value. (Protocol 20.) When the price of dyes resumes a reasonable level it seems very probable that some selected ones may be found well adapted to internal antisepsis and especially in attempting to control diphtheria and typhoid carriers.

In some cases it seems probable that, while certain of these dyes are strongly antiseptic in vitro, they are not exceptional germicides and, therefore, in the living animal are almost valueless. Unless the micro-organism is killed favorable conditions for growth are very soon resumed.

This is to a degree applicable to the chemical substance known as Chinosol which appears on the market also under the name Pix Cresol (*Journal American Medical Association*, 1911). While it actually has exceptionally high antiseptic value—many times more powerful than phenol—its germicidal value is almost negligible, and it finds little practical use.

To summarize the conclusions that may be drawn from the foregoing we find:

First, formaldehyde, when used under conditions in which the gas acts in an aqueous solution, is an efficient disinfectant, probably the only generally applicable fumigant.

Second, mercuric iodide combined with potassium iodide is an exceptionally valuable germicide for the skin and for disinfecting surgical instruments and vessels. Its germicidal value is 5,000 times as high as that of phenol.

Third, lime water freshly slaked from good stone lime has high germicidal value, but its objectionable features both in itself and in its action on other disinfectants makes its use more or less detrimental.

Fourth, soap can be considered valuable only as an aid to disinfection or as a vehicle for an active agent. Most disinfectants with the exception of mercuric-potassium iodide add little to the efficiency of soap.

Fifth, alcohol as commonly used, *i.e.*, on the skin previously washed with soap and water is highly efficient, in percentages of 30 or over.

Sixth, a coal tar disinfectant carefully standardized by one of the accepted methods is valuable in proportion to its phenol coefficient and is less affected than some others by the factors which tend to inhibit the value of a germicide.

Seventh, pine oil disinfectants and other special products require as careful standardization as the coal tar disinfectants. For safe use the dilution should not exceed a number representing the result of the phenol coefficient, times the dilution of pure carbolic acid which would be used with confidence under similar conditions.

Eight, certain of the aniline dyes give promise of practical value in wounds and as internal antiseptics because of having a selective action toward certain microörganisms and because of their low toxicity.

The old dependable germicides, mercuric chloride, phenol, iodine, hydrogen peroxide, will never be displaced, but undoubtedly their field of usefulness will become more and more restricted. The trend of future research in the field of disinfection leads toward the development of specific germicidal agents.

Appendix.

Protocol 1. From original notes.

Silver compound Tested by Hygienic Laboratory Method.

	Medium Adjusted to 1.5 acidity.	
Dilutions.	*2½ min.*	*5 min.*
1–25	−	−
50	−	−
75	−	−
100	−	−
150	−	−
200	−	−
250	−	−
300	−	−
400	−	−
500	−	−
600	+	−

	Medium not adjusted—acidity 0.8.	
	2½ min.	*15 min.*
1–25	−	−
50	+	+
75	+	+
100	+	+
150	+	+
200	+	+
250	+	+
300	+	+
400	+	+
500	+	+

Protocol 2. From original notes.

Formaldehyde gas generated in a space of 800,000 cc. capacity.

54 cc. failed to kill bedbugs and roaches.

16 cc. failed to kill flies and moths.

These quantities exceed the amount necessary for efficient fumigation which is 13 cc. for this space. The experiments with bedbugs and roaches were continued with increasing amounts to determine if any quantity is toxic in vapor form.

The solution is said to be more or less toxic to flies when ingested, but is by no means a specific poison when so used.

Protocol 3. From Bul. No. 27. Hygienic Laboratory.

Experiment 4.

Formalin used	600 cc.
Permanganate used	300 gm.
Capacity of room	2,000 cu. ft
Yield of formaldehyde	33%
Temperature	77°F.
Relative humidity	72%

Results	5	10	15	20	30	45	60
B. pyocyaneous	+	+	−	−	−	−	−
B. coli communis	+	−	−	−	−	−	−
B. dysenteriæ	+	+	−	−	−	−	−
B. subtilis	+	+	+	+	+	+	−

Experiment 6.

Formalin used	600 cc.
Permanganate used	300 gm.
Capacity of room	2,000 cu. ft
Yield of formaldehyde	37.7%
Temperature	71°F.
Relative humidity	45%

Results	5	10	20	45	60	90	120
B. pyocyaneous	+	+	+	+	−	−	−
B. coli communis	+	+	+	−	−	−	−
B. dysenteriæ	+	+	+	+	−	−	−
B. subtilis	+	+	+	+	+	+	+

Difference due to percentage of humidity.

Protocol 4. From original notes.

Germicidal tests of samples of Castile soap. Sample 1–6 inclusive were practically neutral. Sample No. 8 was distinctly more alkaline than No. 7 and both contained decidedly more alkali than the others.

Sample phenol.	*Coefficient.*
1	.05
2	less than .05
3	less than .05
4	.07
5	.05
6	.05
7	.18
8	.26

Adding 1 part KOH to 30 parts of No. 4, the resulting mixture had a coefficient of .3.

Protocol 5. From "Soaps from different glycerides," Hamilton. *J. Ind. & Eng. Chem.*, Aug. 1911.

Test organism—B. typhosus.

+ indicates growth in subculture.
− indicates no growth in subculture.

Glyceride.	*Oil used.*	*Dilution.*	*Result in 5 min.*
Trilaurin	Cocoanut . . .	1–40	−
		1–50	+
Tribrassin	Rape seed . . .	1–20	+
Trivalerin	Whale.	1–20	+
Trilinolein	Linseed	1–20	+
Triricinolein	Castor.	1–20	−
		1–30	+
Tripalmitin	Palm.	1–20	+
Triolein	Olive.	1–20	−
		1–30	+
	Resin.	1–20	+

Protocol 6. From "Germicidal Value of Ethyl Alcohol," Harrington & Walker, *Boston Medical and Surgical Journal*, Vol. 148, 1903, p. 548.

B. typhosus—Dried.

Alcohol	5	10	15	30	45	60 min.
15%	+	+	+	+	+	+
20	+	+	+	+	+	+
25	+	−	−	−	−	−
30	−	−	−	−	−	−
80	−	−	−	−	−	−
85	+	+	+	−	−	−
90	+	+	+	+	+	+
B. typhosus—Moist.						
15	+	+	+	+	+	+
20	+	+	+	+	+	+
25	+	−	−	−	−	−
30	−	−	−	−	−	−
90	−	−	−	−	−	−
99	−	−	−	−	−	−

From original notes.

	1	2	3	4	5 min.
25	+	+	+	+	+
30	+	+	+	+	+
40	–	–	–	–	–
85	–	–	–	–	–
90	+	–	–	–	–

Protocol 7. Phenol coefficients claimed for a commercial product.

Toward	B. pestis	40
	B. diphtheria	30
	B. entericus	20
	B. coli	17
	Cholera	42

From original notes.

Coefficients of two disinfectants based on two different organisms.

	B. typhosus.	*B. pyocyaneous.*
Disinfectant 1	4	2
" 2	16	4

Protocol 8. From original notes.

Phenols separated from coal tar oil and redistilled to further separate at each 10° C. or at such points as to obtain sufficient for germicidal test.

Emulsive disinfectants containing 78 per cent. of oil were made from each.

Boiling points.	*Coefficients.*
200°–210° C.	5.5
210°–220° C.	8.7
220°–230° C.	14.5
230°–240° C.	18.1
240°–280° C.	24.

The entire phenols made into a similar product had a coefficient of 17.

Ordinary cresylic acid with boiling points of 185°–205° has a coefficient of 4–5.

Protocol 9. From original notes.

Phenol in aqueous solution.

	2½ min.	*15 min.*
1– 90	–	–
1–100	+	–
1–110	+	–
1–120	+	+

Phenol molecularly combined with caustic soda.

1–20	–	–
1–40	–	–
50	+	–
60	+	+
80	+	+

Phenol molecularly combined with lime.

1–20	–	–
40	+	+
60	+	+
80	+	+

Protocol 10. From original notes.

Cresylic acid and soap.

[Cresol Compound U. S. P.] containing 50 per cent. cresols.

Dilutions.	*2½ min.*	*15 min.*
1–180	–	–
200	+	–
220	+	–
240	+	+

Cresylic acid combined molecularly with lime.

Dilutions based on cresol content.

1–175	–	–
200	–	–
250	+	–
300	+	+
350	+	+

Cresylic acid combined molecularly with caustic soda.

1–160	–	–
200	+	–
240	+	+
280	+	+

Coefficients based on the cresol content.

1st	approximately	4
2nd	"	2.4
3rd	"	2.

Protocol 11. From original notes.

Germicidal assay of freshly slaked lime.

Dilutions based on the lime (CaO) used.

Dilutions.	*15*	*30*	*45*	*60*	*min.*
1–1,000	−	−	−	−	
1,500	−	−	−	−	
2,000	−	−	−	−	
2,500	+	−	−	−	
3,000	+	+	+	+	
4,000	+	+	+	+	
Phenol dilutions.					
1–120	−	−	−	−	
140	+	−	−	−	
160	+	+	+	−	
180	+	+	+	+	

Coefficient about 20.

Protocol 12. From original notes.

Disinfectant No. A, about 80 per cent. Cresylic Acid, [Cresylic Acid 8 cc., Soft Soap 2 gm.]

Disinfectant No. B, about 50 per cent. Cresylic Acid, [Cresylic Acid 5 cc., Soft Soap. 5 gm.]

HYGIENIC LABORATORY METHOD.

Dilutions.	*Results.*			
No. 1 and No. 2.	2½ *min.*		15 *min.*	
	A	B	A	B
300	−	−		
400	−	+		
450	−	+		
500	−	+		
550	−			−
600	−			−
650	+		−	+
700	+		−	+
750			−	+
800			−	
850			+	

Phenol.		
90	−	
100	+	
110		−
120		+

Coefficient A 6.9.
B 4.6.

When calculated to the cresylic acid on the basis the amount contained in each

Coefficient A–8.6.
B–9.2.

Protocol 13. From original notes.

GERMICIDAL ASSAY—HYGIENIC LABORATORY METHOD.

Sample of disinfectant that has been exposed to the light August 28–September 19–28. (1) compared with the original sample (2).

		2½	15 *min.*			2½	15 *min.*
	1–1,200	−			1–1,200	−	
	1,400	+			1,400	−	
(1)	1,600	+	−	(2)	1,600	−	−
	1,800	+	−		1,800	+	−
	2,000		−		2,000		−
	2,200		+		2,200		+

1–1,200	−		1–1,200	−	
1,400	−		1,400	−	
1,600	+	−	1,600	−	−
1,800	+	+	1,800	+	−
2,000		+	2,000		+
2,200		+	2,200		+

1–1,400	−	−	1–1,400	−	−
1,600	+	−	1,600	−	−
1,800	+	+	1,800	+	−
2,000	+	+	2,000	+	+
2,200	+	+	2,200	+	+

Phenol.		
1–100	−	−
110	+	−
120	+	−
130	+	+
140	+	+

Coefficient (1) 13.6.
" (2) 15.

Protocol 14. From label on package of disinfectant. "Leaves no odor. A powerful antiseptic and germicide of the Naphthalene series."

Inert Ingredients.
Water 23 per cent.
Glycerine 40 per cent.

"Seven times less poisonous and ten times more efficient than carbolic acid."

From results of assay

Dilutions.	2½	5 *min.*
1–100	–	–
175	+	–
200	+	–
250	+	+
300	+	+
400	+	+
600	+	+
800	+	+
1,000	+	+
Phenol.		
1–110	–	–
120	+	–

Coefficient 1.6.

Protocol 15. From Public Health Reports, Oct. 8, 1915, p. 3008.

B. typhosus, 20° C.

Phenol.	2½	15 *min.*
80	–	–
90	+	–
100	+	–
110	+	+
120	+	+
Pine Oil Disinfectant.		
375	–	–
400	–	–
450	+	–
500	+	+
550	+	+

Coefficient 4.75.

Note growth from 500 dilution in 15 min. subculture.

Protocol 16. From original notes. Pine Oil Disinfectant. From John A. MacKeathan, Fayetteville, N. C.

HYGIENIC LABORATORY METHOD.

Dilutions.	2½	15 *min.*
1st test.		
1–150	+	–
200	+	–
300	+	+
400	+	+
500	+	+
600	+	+
2d test.		
Dilutions.	2½ *min.*	15 *min.*
1– 50	–	
75	+	
100	+	+
125	+	+
150	+	+
200	+	+
3d test.		
1– 30	–	
40	–	
50	–	–
75	+	–
100	+	+
125		+
Phenol.		
1–100	–	
110	+	–
120		–
130		+

Coefficient .55.

Protocol 17. From original notes. Chloramine Assay—Hygienic Laboratory Method.

	2½ *min.*	15 *min.*
1,800	–	
2,000	–	
2,200	+	
2,400	+	–
2,600	+	–
5,000		–
6,000		–
8,000		–
10,000		–
12,000		+

Coefficient about 50. This test shows how important a factor time is in testing the value of Chloramine.

Protocol 18. From original notes.

Germicidal test of a mixture of water soluble phenols applicable where freedom from toxicity and irritation combined with high efficiency are essential factors.

Dilution.	*Time and Results.*	
	2½ min.	*15 min.*
1,800	–	
2,000	–	–
2,200	+	–
2,400	+	–
2,600	+	+
Phenol.		
90	–	
100	–	
110	+	–
120		–
130		+

Coefficient 20.

Protocol 19. From original notes.

Germicidal value of a saturated solution of Chloretone in distilled water (about 0.8 per cent.). The solution was inoculated with a culture of B. *typhosus* and sub-cultures taken at 1 minute intervals as follows:—

1	2	3	4	5	6	7	8	9	10
+	–	–	–	–	–	–	–	–	–

Protocol 20. From original notes.

Germicidal test of Methyl Violet against B. *diphtheria.* Sub-cultures made at 1 minute only.

Dilutions.	*1 min. Sub-cultures.*
1,000	–
2,000	–
5,000	–
10,000	–
15,000	–
17,000	–
18,000	+
20,000	+

Test of Gentian Violet under the same conditions.

Dilutions.	*1 min. Sub-cultures.*
1,000	+
5,000	+
10,000	+
20,000	+
50,000	+

Test of Malachite Green under same conditions.

Dilutions.	*1 min. Sub-cultures.*
500	–
1,000	–
1,200	–
1,400	+
1,600	+
2,000	+

INSTITUTIONAL SEWAGE PLANTS.

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Read before the Public Health Administration and Sanitary Engineering Sections, American Public Health Association, Rochester, N. Y., September 7, 1915.

HOTELS, industrial establishments and institutions which house or employ a large number of people, use great quantities of water daily in toilet, bath, laundry and kitchen. This water, known as sewage, after having served its purposes, is charged with organic matter, grease, soap and other impurities, which will, when exposed to the air, putrefy and become a source of nuisance, unless provision is made for adequate treatment.

The population of hotels, institutions, etc., is concentrated on a few acres of ground so that the sewage must of necessity be discharged in comparatively large quantities at but few points, in contradistinction with the community or village which has its population distributed over hundreds of acres of ground and discharges small quantities of sewage daily at numerous points.

It is for this reason that the village with a population of several thousand may be able to get along without sewage treatment while the institution with the same population cannot.

Careful consideration as to location on ground available for sewage treatment purpose, is of first importance. Isolation from the institution, public highways, present and future residence sections, is highly desirable. The direction of the prevailing winds when the atmosphere is humid and hot also must not be lost sight of. By giving too great weight to element of low cost of construction and operation, one can easily be led into the selection of a site which may for sentimental reasons be unfortunate, from the fact that a sewage plant must not intrude itself too much upon those who occupy and manage an institution. The human mind appears to be averse to having its attention called too frequently to the fact that there is close by a plant where sewage is being treated. Sewage plants have been known to be charged with emitting bad odors, merely because the location brought the plant to the attention of those living near and suggested it as the cause, even though the source of the odor was something entirely different. In other words, the sentimental side of the matter is quite important, and cannot be overlooked in choosing a location. In fact, I am of the opinion that sentimental considerations often outweigh practical and economical ones in location.

Topographical conditions, the character of the soil, and accessibility, too, must be given proper weight, as it is only with these conditions favorable that initial low cost and economical operation are possible. Favorable topographical conditions are found where the surface of the ground is flat, near by a stream, and farther on steep enough to allow fitting into the natural conditions, the different units of the plant, so that the sewage may flow through it by gravity; and the topographical conditions are farther enhanced if they admit of the sewage being brought to the plant by gravity. On the score of economy and simplicity in operation, it is undesirable to lift or pump sewage, although it appears that breaking up of the solids, by centrifugal pumps, has its value, as sewage from institutions generally has but a short distance to travel and therefore arrives at the plant in practically its original state.

The character of the soil may be favorable or otherwise. If the soil is sandy and other conditions favorable, it is possible that a very simple broad irrigation plant may answer, otherwise more modern and expensive units will be necessary with a corresponding increase in initial cost.

Accessibility has value for the reason that, if a plant is too far out of the way, it may be more or less forgotten, become clogged, and work inefficiently.

Sewage treatment has been developed largely through experiments carried on by laboratories of educational institutions and experimental work carried on by national, state and municipal governments.

Institutional sewage is for all practical purposes of the same character as village sewage and, therefore, the type of treatment plant that will give results for the town, may be successfully employed for the institution.

Much progress has been made in recent years in perfecting settling tanks that produce a thoroughly decomposed sludge, which gives off no offensive odors and is easily handled, so that the tanking or settling of raw sewage may be better and more easily accomplished than was formerly possible, and bad odors are less liable to arise.

Great advance, too, has been made in the filtration and aeration of settled sewage. The new practice is to spray the sewage effluent on coarse-grained filter intermittently rather than to apply it by the alternate draw and fill plan so extensively used some years ago. The method of applying the sewage to the filter under the spraying or percolating system is very much simpler than the draw and fill plan and therefore more dependable and positive in action which is a matter of great importance.

Simply settling sewage, with a subsequent treatment on a percolating filter, may be quite sufficient treatment, if the effluent from the coarse-grain filters can be discharged into a large stream or body of water, the oxygen in the water being well able, especially in a flowing stream, to oxidize the small organic content of the effluent. Such good fortune is, however, rarely met with and on the contrary the stream available may not only be small but also be used for drinking purposes, bathing, or flow through pasture land farther down stream. Such cases require a third treatment, either sand filtration or disinfection Should sand filtration be sufficient, several or a series of small simply constructed sand filters may be constructed and dosed intermittently from the percolating filter, the individual filters being dosed for a short period and then allowed to rest, while the other or the others of the series are being dosed in turn. Settled percolating filter effluent may be applied to such beds at comparatively high rates, about 600,000 gallons per acre, with satisfactory results, and with but little attention.

Where the final requirements are high, a chemical finishing process may be successfully employed at a low cost, but not without daily attention.

Liquid chlorine or chloride of lime dissolved in water will, when added to the sewage effluent of a percolating filter, produce a sterile effluent, provided that the proper proportions are used, and that the chloride solution is added uniformly and well mixed with the sewage effluent coming from the filter, five to ten pounds of chloride of lime added to 135,000 gallons of sewage effluent should give good results. Tests covering a period of six years at Danville State Hospital, and for shorter periods at Norristown and Warren Hospitals, show quite uniform results for all seasons of the year.

6

The sludge, or the settled out solids from the raw sewage as it flows through the settling tanks, must of course be removed at regular intervals and disposed of. This, on the institution farm, is usually an easy matter, as there is plenty of labor and ground available for its removal and disposition. Mention has already been made of the fact that the latest types of tanks produce a thoroughly decomposed and entirely inoffensive sludge, which is removed from the tank by merely opening a valve, and its water is drained off quickly by means of a small sand filter. The drying process takes but a few days, when the sludge can easily be handled.

Where natural conditions are favorable, that is where a sandy soil obtains which may be easily and effectively underdrained, the settled sewage may be applied intermittently to the soil, as a substitute for the smaller but more expensive percolating filter. In Pennsylvania, the soil is usually heavy and artificial filters are a necessity. Although expensive to construct, they have permanent value, require very little attention and take up but small space, for they may easily be dosed at rates varying from 1,200,000 to 2,000,000 gallons per day, depending, of course, on the effectiveness of the settling process and the nature of the finishing process required.

The matter of economical arrangement of units to take up but a minimum ground area, and yet provide for future enlargement, deserves more study than is usually given to the subject Compactness not only saves ground space and cost of construction, but it aids efficient operation as the entire plant is at all times before the eye of the attendant.

Sewage treatment, although basically the same for large or small works, differs, however, very materially in the conditions of supervision and maintenance. Large works require a complete organization for operation, which is usually directed by an expert. With the smaller plants, the entire supervision, maintenance and operation may be and often is left in the hands of a man of most ordinary intelligence. It becomes, therefore, necessary in the design to adhere strictly to simplicity and positiveness of operation. All more or less complicated devices must be abandoned, the plant must be as nearly self-operating as possible, and further be "foolproof" against wrongful operation. For this reason, it is well to avoid rotating or fine screens, air lifts, complicated air-locking devices, and pumps.

Hospital sewage contains rags, smaller garments, sticks, pieces of soap, brushes, and an innumerable number of other things which insane patients manage to get into the sewers. This condition makes pumping, especially where the flow is small, not altogether satisfactory for the reason that much clogging of pumps results. Clogging may be avoided by fine screening, but this operation adds another difficulty, as screenings are difficult to dispose of, and the chances are good for screenings to be allowed to accumulate with more or less of a nuisance resulting.

The sewage treatment problem can be much simplified by intercepting at the source greases and soap in the solid, rags, and sticks, raw vegetables and fruits. Where the run of sewage is short and there is little screening and no breaking up of solids just mentioned by pumps, in warm weather, disagreeable sour odors may arise from the decomposition of undigested vegetables and fruits on top of settling tanks, as such matter is hard to get into the lower compartments of settling tanks.

As already noted, the sewage plant at an institution is likely to get into the hands of one who has but very ordinary intelligence and I know of one case where a mental defective has charge and another where a man past 70, inmate of a poor house, has charge. It is but just to add that in both cases the plants have excellent care, and the results of operation are quite satisfactory.

The reasons, I believe, are these: The operation is simple enough for them to fully comprehend; they are pleased by the fact that they are entrusted with an important branch of the institutional equipment; the results are always apparent, that is to say, chemical and bacteriological analyses are not necessary to show to the operator whether the results are good or otherwise.

The State Department of Health of Pennsylvania requires that samples of raw sewage and the effluents of the several units of the plant be taken weekly and sent to the department laboratories for bacteriological analysis. Although this method may not, in every instance, prove satisfactory, yet, on the whole, it appears to have the merit of interesting superintendents and operators and indirectly effects careful operation.

No one part of sewage treatment is more important than careful operation, which, among other things, requires that wiers be kept clean, that the rising sludge in air vents of Imhoff tanks be kept down, either by application of water daily, or by forcing it down with a rake; that floating matters in sedimentation compartments be kept scummed off; that nozzles of percolating filters be kept free from clogging; that the lines of pipes in the distributing system be frequently blown out; that the sludge in the settling tanks be withdrawn at regular intervals, and dried sludge promptly removed; that sand-beds be kept level and uniformly porous, to not admit of short circuits to form; that hypochlorite solutions be kept to required strength and applied uniformly and not spasmodically. For best results, records should be kept of daily flow, dates of sludge removal, results of analysis, and putrescibility. In fact, a sewage plant should be as carefully operated as an electric light or a refrigerating plant, or any other piece of machinery from which uniform standard results are required.

* * *

REFUSE DISPOSAL IN SMALL TOWNS.

George W. Simons, Jr.,
Chief, Bureau of Engineering,
State Board of Health of Florida, Jacksonville

Read before the Public Health Administration and Sanitary Engineering Sections, American Public Health Association, Rochester, N. Y., September 7, 1915.

NOT long ago a middle western engineer made the following statement: "It is no uncommon thing to hear small town officials boast of a Great White Way lighting system and a casual observation, even at night, often discloses alleys reeking with garbage and refuse for the want of a regular collection system." This statement practically covers the ground but to make it more comprehensive I wish to include disposal systems as well as collection systems. If proper disposal methods are employed, collection systems are more than likely to be satisfactory.

In order to confine this paper to the present conditions as found in small towns, I shall take the liberty to discuss only towns under 8,000 inhabitants, assuming these as being typical of other small towns.

The information contained herein was acquired largely from a recent investigation conducted during the past year by Mr. Gladding and myself—also from personal trips taken and observations recently made.

The refuse problem in the average small town has received little or no attention up to the present time. In answer to numerous inquiries from towns throughout the country, it was astounding to note the laxity and carelessness shown this branch of sanitation. Not small towns alone are guilty of inactivity but it is regrettable to see many well-known large cities among the number. Methods of disposal in vogue are indeed primitive, but when one stops to consider and analyze the situation in the small town, conditions are not so alarming as at first it may seem. The methods of disposal employed are all that are demanded by the citizens and they seem perfectly satisfied in most instances. Owing to the small per capita quantities of refuse produced, the uncrowded living conditions, ample available dump grounds, lack of serious nuisances arising from refuse, all of which factors explain are reasons why the problem has not received more attention to date. The problem has not been brought forcibly to the attention of city officials as yet to any marked extent, but I am pleased to say that there is evident an awakening among many small town officials and in some cases actual signs of real live interest are being manifested. It was not uncommon in the investigation to have a city official express extreme regret at the condition his town exhibited. Lack of finances, lack of initiative coupled with lack of interest and coöperation is probably the real root of inactivity —considered in conjunction with the other above factors—in this line of sanitary municipal cleaning.

Commencing with the smallest unit and working to the largest we will note actual conditions as found today. In the towns, which by some present would be designated as villages—towns having populations not in excess of 1,500 people —we find no regular disposal system employed. In these places the houses are well distanced from each other, there is sufficient room and possibly each house or approximately every house keeps chickens, a dog, cats or even pigs. When the meals are finished the waste food matter is either cast out to the animals, or thrown into the slop pail to be dumped in some nearby low spot, and sometimes thrown onto the rear yard of the premises. The liquid waste is generally thrown onto the yard or into the alley, it being no uncommon sight to see streams of swill trickling down some alley. The ashes are thrown out each day on to a pile which accumulates throughout the winter and in spring is carted away to some low spot by the householder or a hired team. The rubbish, usually small in amounts, is either burned or thrown away with the ashes. Apparently no system is practiced, the disposal problem being of the least significance and when refuse does accumulate and become troublesome it is easily removed to some remote place.

Passing to larger towns—in range from 1,500 to 3,000, we still find no regular systematic disposal employed. These towns, as previous ones, are rural—many of the people keep chickens, pet animals and even pigs. What kitchen waste is not fed to the animals is thrown into the pail to be dumped as in the smaller towns. But in this instance the dumping ground is farther removed from the house and a teamster is paid by a number of people to cart the refuse to the dump ground. The ashes and rubbish, old cans, iron, etc., is removed once or twice a year as is seen fit by the householder. In many cases of towns within this limit, the town owns the dump ground which is located at the city limits or beyond. On the dump ground every waste product is placed and unless the dump is well attended and trimmed it is all but commendable. Even here the problem is not of much concern to the townsman, one or two men having carts with which they collect refuse from a few of their subscribers whenever time from other work allows. In some of these places farmers come to town and collect the organic waste each day from a few people, which they utilize for hog feed. Recently, in one of these small towns of 3,000 people, I spent considerable time studying the situation. Here the municipality maintained a dump yard at which, every day was kept a man whose duty it was to trim the dump, spread the material about, mix it, burn the loose paper and inflammable matter. As a result the dump looked very satisfactory, was neat and furnished a favorable means of disposal in this case. It was located a sufficient distance from the town so that odors were not perceptible at any time, as a matter of fact, odors were not noticeable 300 feet distant. This system of municipal dumps in small towns, if well attended, well trimmed, furnishes a favorable form of disposal, but one which is not to be encouraged or recommended.

In towns of this size and larger, 3,000, a junk dealer is located who picks up and buys scrap iron, metal, old rubbish, paper and rubber. This practice rids small towns of much bulky rubbish, at the same time brings considerable revenue to the inhabitants. Papers are sometimes baled and saved for the market—much of this work being done by charitable organizations.

In towns from 3,000 to 8,000, the problem begins to assume some of the serious complications met with in the larger cities. These places the dump is yet a favorite method. In one instance of a New England town of 8,000 a piggery is maintained at the poor farm, the garbage is collected three times weekly, sterilized before feeding and finally the pigs are sold while young at prices varying from $3.00 to $5.00 per hog.

In these places, many of which are growing rapidly, the available dump grounds are fast disappearing. The towns are spreading outside their former limits with the inevitable result—the former dump system is doomed. These places need an awakening. Incinerators or destructor furnaces which will burn everything, and give back power as a by-product should be installed. Rubbish burners, as at Dover, N. H., are being used in places where the garbage is retained for hog feed.

The disposal of manure is receiving more attention each season. In the smallest towns no precautionary measures are observed and the pile outside the barn is a familiar sight. But in the larger cities covered and screened pits are used and manure is hauled to nearby farms frequently. The people should be encouraged and taught to construct these tight pits, screened and covered because of the well-known fly-breeding propensities.

A troublesome form of waste in the small town coming to my attention this summer, which waste is more of a nuisance than all others, is that produced daily in the grocery and fruit stores. These establishments each day cast away the decayed and partially decayed vegetables and fruits. Only a few weeks ago I noted one and the same barrel filled with this class of refuse standing for two weeks without removal. It is a strong attraction for flies and rats and on warm days disseminates an unpleasant sour odor. The lack of a collection system was in this case, responsible for this condition of things—but the power of the health officer in such cases can be applied even in the absence of a collection system.

From this brief résumé it can be seen that the refuse disposal problem in the small towns has not advanced much from the primitive methods except in the cases of the towns which have city tendencies. The dump is still the favorite method of disposal for all classes of refuse in the small town as long as land and places for dumping exists, and as long as no initiative is taken.

Most of the average towns have city ordinances on their books relative to the refuse matters, but that is as far as it goes. The question then arises—what will the city do, what kind of disposal can be employed most economically by the small town?

The dump, although not to be recommended or encouraged, is a necessary evil in the smallest towns. Lack of finances and a sufficiency of waste land will favor the dump yard. But if the dump is employed part of the health officer's business should be to see that it is properly attended and that the people using it exercise care in dumping. The material should be spread out to allow rapid drying and all inflammable material burned. Careless dumping of refuse around the yards, in the vicinity of houses, and the throwing of slops into the yards should be discouraged; where possible, proper drainage should be provided into sewers, or drains. The employment of closed cans at the house should be encouraged, also. Dumps will be used in most of the towns and when possible attendants should be furnished who are capable of caring for the yard.

The burial of refuse, garbage alone or garbage and ashes mixed, is found to be a satisfactory method of disposal providing the material is not buried too deep and in too large quantities, moreover the burial ground should consist of dry porous soil. Shallow trenches about one and one-half feet deep by seven feet in width are suitable and after filling should be covered with a loose covering of dirt—about five inches of dirt. From experiments carried on in Ohio it can be said that for a porous soil, about one and one-half acres are required to handle one ton-year of garbage and the same soil can be reused in two years. The burial method is better adapted to southern cities where it is warmer, but northern cities also employ it satisfactorily.

Incinerators, destructor furnaces and rubbish burners should be employed in the larger small towns—towns of 5,000 or over. These furnaces are generally made up in units of various tonnage capacity and furnish the only real sanitary, cleanly disposal of all organic, decomposing wastes. Incineration should be encouraged and given a boost wherever possible.

ACUPUNCTURE: THE BEST METHOD OF VACCINATION.

H. W. Hill, M. B., M. D., D. P. H.,
Director of Institute of Public Health, M. O. H. of London, Canada.

ACUPUNCTURE is the new method of vaccination which bids fair to do away with the old scarifying, scraping or scratching methods so familiar to our forefathers. These punctures are one one-thousandth of an inch deep and would not go through an ordinary visiting card. The extreme tip of an ordinary sewing needle, carefully sterilized, is used. Not a shred of the epidermis is removed. So slight is the pain that in several instances the operation was complete before the patients knew it had even begun.

If the vaccination does not take, nothing happens at all. If, however, the person has been successfully vaccinated before (or has had smallpox), the punctured surface will redden, swell slightly and become slightly itchy for a day or two immediately following puncture. This is the anaphylactic reaction. In those cases where the vaccination takes, the puncture spot will show nothing for four or five days, then redden, swell, and a single smooth pearly "button" arises about the size of a large green pea. In ten days or so this will shrink and become a dark dry "button" and in about ten days more, the "button" will gently separate leaving a small round scar. Ordinary areola develops and some tenderness of the axillary glands occurs.

Recently over sixty students of the Western University Medical Faculty were vaccinated by this method.* No one who had been previously vaccinated or had had smallpox took at all; but all these showed the anaphylactic reaction described above. Everyone who had not been vaccinated before took. Three of these took in one spot each, one in two spots, and one in three. There was not a bad arm amongst them nor an hour of work lost or a lost meal. Amongst more than sixty students less than one small drop of blood all told was shed. This method therefore gave 100 per cent. of success in all the possible directions and not a failure of any description from any standpoint.

In two cases of students who showed the anaphylactic reaction although they had never been previously successfully vaccinated and had never had smallpox so far as they knew, careful investigation through their mothers of the alleged attack of chickenpox which both of them had had showed that in the one case it certainly was smallpox and in the other it very probably was. It is not uncommon for mild smallpox to be mistaken for chickenpox and some persons fail to take vaccination simply because they have had smallpox although they thought it was chickenpox.

Acupuncture vaccination is done as follows: The arm is washed with soap and water, then with alcohol, and finally with ether. A small drop of vaccine is deposited on the clean surface. The vaccinator's hand is closed upon the arm from behind so as to draw the skin tight in front, and the sewing-needle point, held slantingly nearly parallel with the arm, is pressed against the skin through the drop of vaccine. Then it is that one one-thousandth of an inch of the point snicks through the upper layer of the skin, carrying the vaccine with it. The needle is instantly withdrawn and another puncture exactly like the first is made close beside it, until a dozen punctures are made in the space of one-sixteenth of a square inch or less. The whole process of puncture takes perhaps fifteen seconds. At once with a bit of sterile gauze, the surface vaccine is removed, and the sleeve drawn down. Total time from rolling up the sleeve to rolling it down again, five minutes, most of which is occupied in washing the arm before making the punctures.

As a rule it is best to make three sets of punctures, one at each of the angles of an equilateral triangle having sides two inches long. Three scars are better than one and sometimes one set of punctures fails to take or even two; while out of three at least one "button" usually develops if the patient is susceptible to vaccine at all.

As in all vaccination by any method, neither the vaccinator or the vaccinatee should talk during the process lest the mouth spray should be carried in with the vaccine. In the puncture method the danger of infection from this source is, as from every other source, infinitesimal, for two reasons, first because there is no blood drawn and blood in a vaccination wound is the great inviter of infection. Second, because no epidermis is removed as in the old method, and the epidermis is the natural protection of the body against infection. At the same time, there is no danger of tetanus because the puncture is less than one one-thousandth of an inch deep.

A strip of sterile gauze may be pinned or sewed to the inside of the undershirt so that it lies just over the punctures. No other dressing should be used under any circumstances whatever; no shield, no absorbent cotton, no bandage, no adhesive plaster. "*Leave it alone!*" Don't wash it, don't scratch it, don't do anything to it. After the vaccinator has made the punctures nature will do all the rest that is required.

Vaccination by the puncture method is perfectly harmless. If the patient is already protected, he will not take: if he is not protected then the only thing is to become protected. The arm is punctured; if protection is needed, protection will develop; if it is not needed, nothing happens, except the anaphylactic reaction which is the proof that protection is not needed.

This method was first suggested to the writer by Dr. J. H. Kinyoun of Washington, D. C., a number of years ago. It has been used with great success in Minnesota and in London, Canada.

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* Since writing this article the acupuncture method has become the official method in Military District No. 1, and many hundreds of soldiers have been vaccinated by this method with peculiarly gratifying results.

By organizing the vaccination and having about eight orderlies to do the various stages of washing, placing the vaccine in position, etc., the Medical Officer can perform about three acupuncture vaccinations per minute, which means that six hours will suffice for the vaccination of the battalion.

It has been found that no dressing whatever, not even the small piece of cloth mentioned in the text is necessary. In fact, the men do better without any dressing at all.

Henry Dwight Holton, A. M., M. D.

An Appreciation and Biographical Sketch.

Henry Dwight Holton, A. M., M. D., President of the American Public Health Association in 1901 and 1902, died at his home in Brattleboro, Vermont, February 12, 1917, of malignant disease of the pancreas.

Dr. Holton was born at Saxtons River, Vermont, July 24, 1838. His preliminary education was obtained at Saxtons River Academy. He studied medicine with Doctors J. H. Warren of Boston and Valentine Mott of New York, graduating at the University of New York in 1860.

After six months of dispensary work in Brooklyn, he settled in practice in Putney, Vermont. His practice there was that of a general practitioner, and was extensive. In 1867 he removed to Brattleboro, where he spent the rest of his life. He early took a leading place in the profession of the Connecticut Valley. His practice reached into Massachusetts and New Hampshire. He was long the best known surgeon of these parts and enjoyed the confidence of the profession over a wide range and to an unusual degree. Doctor Holton's professional activities continued until his election as Secretary of the Vermont State Board of Health in 1900. He gradually relinquished his practice thereafter and devoted himself to his official work and the many business and scientific organizations with which he was connected.

During his active professional life he was a member of the Connecticut River Medical Society and the Vermont State Society and served each as president. In 1873, he was called to the chair of Materia Medica in the Medical Department of the University of Vermont and filled this lectureship thirteen years. He was also a trustee of the University and State Agricultural College for eighteen years from 1873. At the same time he was medical examiner of the Vermont Asylum for the Insane at Brattleboro.

He joined the American Medical Association in 1864, was a vice-president in 1880, and delivered the oration in State Medicine at the Baltimore meeting in 1895. He was active in the organization of the Pan-American Medical Congress and in the National Society for the Study and Prevention of Tuberculosis, and was a member of numerous other scientific organizations in this country and abroad.

Of all his scientific society memberships, Doctor Holton always prized highest that in the American Public Health Association. Its members, especially those oldest in its counsels, were among his warmest personal friends. His membership dated from 1875. In 1892, at the first meeting in Mexico City, he was elected treasurer, a position he filled until his election to the presidency in 1901.

Doctor Holton's name in his native state will always be associated with the State Board of Health and its activities.

He was one of a committee of three of the State Medical Society which in 1873 urged the General Assembly to establish such a Board. The report of this committee asked for "favorable consideration for this measure, assured that in no better or more speedily remunerative way can the state appropriate a portion of the people's money or more certainly fulfill its high mission, than in protecting its communities, old and young, from the approach or prevalence of contagious and infectious disease."

Later, as member of the House and of the Senate, he interested himself in the establishment and strengthening of the Board. The Board was finally established in 1886. Dr. Holton was appointed to it in 1896, and was its secretary from 1900 to 1912. In the latter year he insisted on retiring from the secretaryship, though he retained his membership to the end.

A man of untiring energy, in everything he undertook, he devoted himself most unselfishly to the work of the State Health Board. He loved the work and believed in it. He had seen, in his early country practice, the ravages of typhoid, scarlet fever, diphtheria and tuberculosis. He early recognized the possibilities of preventive medicine as regards these infections. He familiarized himself with every community in the state, and learned the individual needs of each. Schoolhouses, water supplies, sewage disposal, disease outbreaks, no detail of local sanitation escaped him. His services were constructive and fearless. He inspired health officers with some of his own energy and optimism, for he was always an optimist. He could criticize a local health officer or prosecute a delinquent man or community and still retain their self-respect. His high notions of official duty were strongly tinctured with good common sense and the milk of human kindness. No finer or juster tribute has been brought forth by his death, than an editorial in a paper, published in one of the five towns, in which it became Doctor Holton's duty, acting for the Board a few years ago, to condemn the public water supply and order a change. Among other things the Enosburg Standard says:

"In the death of Dr. Henry D. Holton, which occurred Monday, at the advanced age of seventy-eight years, Brattleboro and the state of Vermont have lost a man whose long and unselfish service of a public character has been of inestimable value to both.

"Such public service as that rendered by Doctor Holton can not be measured by dollars and cents and was never so measured by him. He gave, without thought of compensation, of his talent and energy, the memory of which and of the many beneficent results of his activities will live after him."

It was fitting that the state legislature, in session at the time of his death, should promptly adopt resolutions of regret and appreciation.

The village of Brattleboro mourns a loyal and public spirited citizen. He was the progressive physician, the intelligent public servant, the astute business man, the kind neighbor.

During twenty-five years' service, as member of the School Board (fifteen years as its chairman) he was largely instrumental in building two of Brattleboro's largest school buildings. The Brattleboro Home for the Aged and Disabled, and the Austine Institution for the education of the deaf and blind, both of which owe their existence chiefly to his industry and broad humanitarianism, were objects of his special care during his last years.

He was trustee from the first of the Brattleboro Free Library, and moderator for twelve years of the town meetings. These are some of the evidences of the confidence of his neighbors of half a century.

The *Vermont Phoenix* speaks of him as a rare combination of skilled medical practitioner and keen business man.

He was for sixteen years president of the Brattleboro Gas Light Company; director for many years, and latterly president, of the Vermont National Bank; and director and vice-president in the Fort Dummer Mills.

He gave generously and unostentatiously. A year's subscription, to each of the 247 local health officers, to the AMERICAN JOURNAL OF PUBLIC HEALTH, and the endowment of a lectureship on Preventive Medicine in the State Medical Society are instances of his benefactions, for a long time anonymous.

His was a life of action. He was of a truth happiest when busiest. When personal bereavement came to him, his consolation apparently was in work. Age did not dull his interest in life's activities, and only of late had disease lessened his vigor. Thirteen days before his death, the State Board of Health held a meeting in his sickroom. In spite of physical weakness, his interest in the activities of the Board was unabated. All present believed he recognized that it was his last meeting with them, yet he took the same sane, practical, view of the subjects discussed as always characterized his counsels.

Doctor Holton married Miss Ellen Hoit, November 19, 1862. Mrs. Holton, for many years in infirm health, died in 1909.

CHARLES S. CAVERLY, M. D.
February, 1917.

FIFTH REPORT OF THE COMMITTEE ON COLD STORAGE.

Presented before the American Public Health Association, Cincinnati, Ohio, October 25, 1916.

To the Members of the American Public Health Association:

YOUR committee in reporting progress wishes to emphasize at the outset its conviction that cold storage of perishable foods is one of the most important factors, if not the most important, in the conservation of such products. As such it has a very direct bearing on the question of public health as well as playing a most important part in the economic aspects of the public life. No one who reads carefully the few facts that we here present can fail to be convinced of both these statements. Nor can it be longer doubted that cold storage, conducted under the optimum conditions which modern science and practice have prescribed, is one of the greatest of blessings to mankind and should be encouraged. We need greater and more widely distributed facilities for the cold storing of perishables to cut down the enormous annual loss from spoilage and thus make available a larger amount of good food at lower costs.

Your committee has noted during the past year a more kindly feeling toward cold stored foods on the part of the consuming public. The prejudice which naturally sprang up when this new method of conserving foods was introduced is slowly breaking down. We believe the time is at hand when the consumer will realize that a cold storage warehouse is only a big refrigerator, such as each householder has on his home premises, excepting that the warehouse is much more perfectly adapted to the purpose of preserving perishable foods, having compartments where varied articles may be kept at temperatures and under conditions best suited to each and not everything in one compartment where the conditions must of necessity be the same for all foodstuffs.

We have also noted a tendency to saner legislation on the part of our law makers although there is still a feeling in many places that cold storage is simply a scheme for cornering a food supply and raising prices. Food officials generally are recognizing the great value of cold storage and are giving encouragement to it under wise regulation. And in general there is cause to feel that distinct progress has been made the past year in promoting the cause of better and more widespread conservation of perishable foods.

FACILITIES.

Ice and Refrigeration, a journal devoted to the interests of those engaged in the ice and refrigeration business, in its issue for October, 1915, summarizes the facilities for the cold storing of perishable foods. It states;

"There are now approximately 1,000 general cold storage warehouses in the United States having cold storage space of about 250,000,000 cubic feet. If to this be added the cold storage rooms in packing houses and breweries, the figures will become, with 650 packing houses and 1,200 breweries, approximately 3,000 cold stores and artificially cooled space of at least 400,000,000 cubic feet. Then, if to this be added the cold storage rooms of creameries, produce merchants and apple storers, at least 2,000 more must be added, and the number of cold stores will reach at least 5,000 and the cooled space approximately 500,000,000 cubic feet, and that still would not include the cold storage refrigerators in some 3,000 meat markets, 600 or 700 ice cream factories, 1,000 hotels, 400 restaurants, 200 club houses, 400 hospitals, 500 confectioners and bakers, 300 department and general stores, 300 grocers, 300 public buildings, asylums, prisons, etc., 200 fish handling plants, not to mention artificially cooled departments in chemical laboratories, powder factories, government posts, etc. The value of the products kept from spoiling by refrigeration in these more than 12,000 refrigerated places has never been estimated, but it must be enormous."

During the year that has elapsed since this statement was written there have been constructed, or there are now under construction, between 40 and 50 new cold storage houses with an aggregate cold storage capacity of from 20,000,000 to 25,000,000 cubic feet. A considerable number of apple storage houses have also been built in the apple growing sections of West Virginia, Arkansas, Missouri, Texas, and New York. A very large part of this new space is located in cities where already large facilities existed. Very slowly, indeed, do warehouses make their appearance in the centers where perishable foods are grown. This committee has more than once pointed out the importance of having local cold storage warehouses thickly scattered in the producing sections. This is most desirable not only from the standpoint of conservation, but from an economic one as well. As we pointed out last year and in another part of this report, the very large drain on our resources due to the European conflict makes it most essential that everything possible be done to stop unnecessary wastage. That these local warehouses are very much needed and that they may be successful when erected and operated is nicely illustrated by a short article which has just been printed in the JOURNAL, entitled "Cold," in the October, 1916, number. A few of these are being built each year, but as yet the number is so small as to be almost negligible. The United States Department of Agriculture has been lending much aid and encouragement to the development of cold storage facilities. During the past year in conjunction with some of the state authorities it has been making an effort to have meat cooling plants established in the South.

TRANSPORTATION.

The use of refrigerator cars in the transportation of perishables is almost as important a part in the conservation of foods as the storage of the same for longer or shorter periods in cold storage warehouses. This branch of the cold storage business has developed very rapidly. An authority on this subject has recently stated that there are now over 100,000 refrigerator cars in the United States and another authority states that at the time of writing (May, 1916) there were between 3,000 and 4,000 cars under construction. These cars are so satisfactory and so well operated that the whole aspect of the trade in perishables has been greatly changed. Those on the Atlantic seaboard may now enjoy the fruits of California and the extreme West. Mr. E. D. Clark, of the Bureau of Chemistry, United States Department of Agriculture, writes that the Pacific now furnishes the bulk of the fresh salmon for the eastern market. Fast express trains made up of refrigerator cars carry the fresh fish from the Pacific to the Atlantic in from five to seven days. The blessing that such a service is to us of the United States is immeasurable.

In Kansas there is a movement under way to require the railroads to place refrigerator cars at egg producing centers to receive eggs as brought by the farmers and thus act as temporary local cold storage warehouses.

Foods Stored.

From the most reliable information available to your committee it would appear that the amount of foodstuffs cold stored in 1916 is somewhat less than that in 1915. The latter year was an exceptional year, every available house having been filled to overflowing. The amount, however, will probably be greater than 1914 and will represent a normal increase.

Each succeeding year sees some new use made of cold storage. Some food heretofore not kept in cold warehouses has been tried and found to keep satisfactorily under such conditions. During the past year California reports successful experiments in the keeping of tuna fish and ripe black figs. The fish, it is claimed, are improved by the cold storage treatment. From St. Paul comes word that it has been found practical to freeze sweet corn on the cob to be served during the winter. The experiment was first tried by Dr. Pennington of the Federal Food Research Laboratory several years ago but has only during the past year been tried on a commercial scale. From St. Paul also comes news of an experiment having been made to keep bread in cold storage. It was found that at temperatures from 38° F. to 40° F. the bread was kept for a period of five days without essential change. Director D. D. Mayne, of the University of Minnesota farm, under whose direction the experiments are being conducted, suggests that if the experiments when completed are successful that it would be possible to eliminate a very undesirable feature of the bakers' trade by doing away entirely with night work. It is further suggested that bread, if allowed to stay in cold storage for a few hours or a few days, would be more wholesome than fresh made bread, as the gases developed in the baking would largely be dispelled. There would also be the advantage of having a positive supply of bread always on hand.

In the wheat growing sections of the country there are often occasions when large quantities of the grain will accidentally or otherwise get wet. Unless some efficient means of drying this wheat is at hand and quickly applied the grain will spoil. It has been found that, for a cost of something less than 10 cents a bushel, damp wheat may be put into marketable condition by giving it a simple cold storage treatment. This past fall, when the wheat crop was so large, there was a great amount of this wet wheat. It is estimated by those in the trade that, had cold storage facilities been available in the districts where this trouble was prevalent, several million dollars could have been saved to the farming communities.

Mr. H. C. Gore, one of the workers in the Bureau of Chemistry at Washington, describes a process of concentrating sweet cider by freezing which he says will make pure fresh cider available as a summer drink at our soda fountains and should open up a new and valuable market for the juice of surplus apples.

These are but a few of the new uses for cold storage developed within the past year.

WASTE.

The primary function of cold storage is to stop deterioration and loss of foods that without it would spoil. That this loss annually is enormous can be readily understood from the figures of Dr. Pennington presented in a previous report showing a $50,000,000 loss in eggs alone. What the loss in other perishables is we do not now know. Your committee is making an effort to obtain this knowledge. The American Association of Refrigeration, through its efficient secretary, has offered to gather for us information of this character. A start has been made but at this writing the data available are too meagre to be of any value. A year from now we shall hope to have some interesting and valuable figures along this line.

Mr. Arthur B. Adams, assistant professor of economics at the University of Oklahoma, has recently written a most interesting book on "Marketing Perishable Farm Products," in which he gives a little information of this character. He says:

"It is estimated that between 20 and 30 per cent. of perishables as a class decay on the farms before they can be sold. At least 25 per cent. of the perishables which arrive at the wholesale markets is hauled to the dump pile because it is unfit for human consumption. In the year 1911 the New York Board of Health condemned and destroyed 6,500,000, pounds of fruit and 2,500,000 pounds of vegetables because of decay. In warm weather, Florida oranges lose 30 per cent. in transportation alone and if we add the decay after the fruit reaches the consuming center the total loss would be astounding. There is a loss of 17 per cent. in eggs from producer to consumer, due to breakage, decay, etc., but butter has an equally great loss. The greater proportion of the perishables which are consumed in the cities are much inferior, because of partial deterioration, to what they were when they left the farms. It is not an overestimate, therefore, to say that between 30 and 40 per cent. of the perishables which are raised on the farms are never consumed at all, but are a complete social loss."

A truly astounding situation which becomes all the more astounding when we understand that the value of the perishables, produced annually, is estimated by the author at $2,100,662.869, thus representing a loss of from $630,000,000 to $840,000,000, which Mr. Adams believes is underestimated rather than otherwise. He also points out that "only between 5 and 10 per cent. of the total annual production of butter, cheese, poultry, and eggs and a still smaller percentage of the fruits and vegetables, are now placed in storage." And the answer to all this is, for the most part, more cold storage facilities, particularly at the points of production and more refrigerator cars.

Scientific Investigations.

Important work has been done during the past year looking to the improvement of the treatment of certain varieties of perishables while in storage. The United States Bureau of Plant Industry has under way experiments for the purpose of determining the optimum conditions for apple storage. *Farmer's Bulletin*, No. 331 of the United States Department of Agriculture, describes some very valuable and interesting experiments in the precooling and cold storing of cherries and prunes. The prompt precooling of both these fruits is urged as a result of these experiments. These experiments were to a large extent duplicated by the officials of the Canadian Department of Agriculture with equally satisfactory results and with the same conclusions.

Dr. Pennington, in the Food Research Laboratory of the United States Department of Agriculture, has been conducting investigations with regard to temperatures in refrigerator cars. This investigation is still under way. *Farmer's Bulletin*, No. 696 of the United States Department of Agriculture, reports the results of some very interesting and valuable experiments in the handling and shipping of citrus fruits in the Gulf States. "The results of these investigations and the results obtained in commercial plants erected prior to the opening of the 1914–1915 season," says the *Bulletin*, "indicate that precooling is a valuable aid to careful and proper handling in insuring sound condition on arrival and for a period of about ten days after arrival at the market." Further, it was found that oranges keep best at temperatures ranging from 38° F. to 40° F., lemons at 42° F. and grapefruit at 45° F. to 50° F.

These are but a few of the investigations which have been or which are now being conducted. Nothing has been found to indicate that cold storage, under proper operation, has any injurious effect upon perishable foods. On the contrary, where the best methods of treating respective classes of foods have been determined, as is the case with a large part of the perishables cold storage has proven its great usefulness to mankind. Perishable food placed in cold storage in good condition will, when kept under proper conditions, be perfectly sound and wholesome when removed after long periods of time.

EDUCATIONAL.

In our report last year we pointed out the desirability of some educational work for the purpose of more rapidly breaking down the unwarranted prejudice against cold stored foods on the part of consumers and of bringing producers to the realization of the importance of a better handling of their products and a prompter storing of their perishables in cold storage warehouses. While your committee has been unable to take any part in such educational work, there has, nevertheless, been a start made along these lines. The American Association of Refrigeration has undertaken a work of this kind. As one of the first steps necessary for an educational propaganda is basic knowledge of the facts, they have first established a library of the literature bearing on the cold storage industry. A catalogue of this library has been printed and circulated. They have also made a bibliography of the American literature relating to refrigeration and have had this printed in booklet form for distribution. Then they have had prepared a comprehensive booklet giving suggestions to growers and shippers of fruits and vegetables as to the best methods of preparation, loading, stowing, shipping and bracing for safe transportation. Other material is in course of preparation and will be distributed as rapidly as it can be prepared. The effect of this campaign is bound to be widespread and of greatest importance.

The New England Fish Exchange, with headquarters in Boston, has, during the past year, established a publicity bureau and has through the medium of the daily press been educating the consuming public of New England not only to the value of fish as a food but to the important and necessary part which cold storage plays in making this valuable food available in good and wholesome condition at all times. We are informed by the administrative officer of that organization, Mr. W. K. Beardsley, that their efforts are meeting with satisfactory results.

LEGISLATION.

Since our last report the states of Maryland and New Jersey have passed the so-called Uniform Cold Storage Law. The laws as passed contain slight modifications from the original draft as prepared by the Commission on Uniform Laws, but they are essentially the same. The Uniform Law was introduced into the legislature of the state of Louisiana, but was later withdrawn. In the state of Minnesota a law was passed requiring the labeling of eggs held in cold storage for a period of longer than thirty-nine days. The state of Illinois has passed a law regulating the operation of egg-breaking establishments. The most notable thing, however, with regard to laws regulating cold storage is the decision of certain courts with regard to the constitutionality of certain regulations in laws already existing.

The California law requiring the branding of imported eggs has been declared unconstitutional. In Pennsylvania Judge Carpenter has declared that part of the Pennsylvania law placing a time limit on the storage of certain food products as unconstitutional. In Buffalo, N. Y., Judge Noonan of the City Court has made a similar decision with regard to a similar provision in the New York State law. As both of these decisions are in harmony with what this committee has stated in at least two of its reports, we feel like briefly reviewing these cases at this point.

The Pennsylvania case is known as *Nolan* vs. *Jones, et al.* Nolan is a dealer in butter and as such stores, from time to time, his product in cold storage warehouses. He brought an action to test the question of the constitutionality of the Pennsylvania state law limiting the storage of products to nine months. The defendants are the State Food Commissioner and two or three of his inspectors. The inspectors, acting under the direction of the commissioners, entered the warehouse, found three tubs of butter which had been stored there for a longer period than nine months. Thereupon they placed on these tubs of butter labels which contained the following phrases among others: "Not wholesome; unfit for use as food; not salable for food." No samples were taken and no examination was made to determine the wholesomeness of the product. Judge Carpenter in his decision finds that Section 16 of the Pennsylvania Cold Storage Law, known as the Cold Storage Act of 1913, is in conflict with the State Constitution, Article 1, Section 1, known as the Declaration of Rights, and also is in violation of the 14th Amendment to the United States Constitution, providing that "No state shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States, nor shall any state deprive any person of life, liberty or property without due process of law, nor deny to any person within its jurisdiction equal protection of the laws."

In discussing his decision, which he does at some length, the judge makes some very interesting statements, some of which are here quoted or summarized. The judge points out that the "Cold Storage Act does not assert that it is based on scientific experimentation or observation." He goes on to say that the time limit might have been cut down to one-half or it might have been doubled. If the act had specified inspection after the time limit imposed and the action of condemnation based on such inspection, then the act might have been found to be constitutional. To sustain the act the judge says that good faith and direct connection with the protection of life and health must appear. In this case he says good faith may be assumed, but appropriate and direct connection with the public health is lacking. In clinching this point he says, "If, therefore, a statute purporting to have been enacted to protect the public health, the public morals or the public safety has no real or substantial relation to those objects or is a palpable invasion of rights secured by the fundamental law, it is the duty of the court to so adjudge and thereby give effect to the constitution." He follows this with the following pertinent remark, "Just wherein the public health is protected or fraud and deception prevented by authorizing certain state officials to brand a recognized wholesome food product 'not salable for food' without any reference whatever to its actual quality and condition, but solely because it has been preserved in a cold storage house for nine months and one day is not apparent. 'Not salable for food' must be held to mean not fit for food, otherwise we have the state interfering with the private affairs of its citizens without even a pretence of reason for so doing and arbitrarily depriving the owner of the lawful use of his property. And if the words 'not salable' mean not fit deception is not prevented, but is in fact practiced and that by the state. For by its officers and agents it avers as a fact that which may not be true and so far as disclosed in the case at bar is not true." He later calls attention to the decision of the Court of Appeals at New York in the case of the *People* vs. *Biesecker*, which declares the following proposition firmly established: "The legislature cannot forbid or wholly prevent the sale of a wholesome article of food." He closes this very interesting discussion of his decision with this statement, "It smacks of special legislation to declare that an article in common use as food preserved by the best methods known to modern scientific discovery shall be placed under the ban and its owner exposed to prosecution, fine and imprisonment if he offers to sell it as food and yet permits the sale of the same article kept as long as and where the owner may see fit outside of a cold storage warehouse."

The Buffalo, N. Y., case was decided on much the same grounds, but the facts were somewhat different. There are really two cases involved in this decision, but the facts being similar the judge rendered the one opinion. The cases are known as the *People of the State of New York* vs. *Frank K. McFall* and the *People of the State of New York* vs. *Walter A. Tuttle*. Both defendants had stored poultry in the Buffalo Cold Storage Company's warehouse. An inspector from the Health Department visited the warehouse, found the poultry belonging to the defendants and noted that it had been in storage for a longer period than ten calender months, the time limit prescribed by the New York State Cold Storage Law, and began prosecution of the two defendants. These cases differed in one essential particular from the Pennsylvania case, in that the law under which the defendants were being prosecuted was amended so as to cover them after the goods had been stored. In their defense, therefore, they alleged that the act was not retroactive and, therefore, could not cover them until the ten months' period had elapsed after the passage of the act. Whereas the action was brought within five months after the law became effective. They also alleged as a defense that the law was unconstitutional for six different reasons, which need not be named here, excepting that one is identical with that in the Pennsylvania case, namely, that it conflicts with the 14th Amendment of the Constitution of the United States. The judge in his opinion states, "I am of the opinion that both defenses are good and that the defendants must be discharged." Judge Noonan discusses his decision at some length very interestingly. He says, "I think the rule by which the constitutionality of Section 337 of the Public Health Law must be determined is that laid down in the matter *Reade* vs. *Jacobs*, New York, '98, as follows: "When a Health Law is challenged as unconstitutional on the grounds that it arbitrarily interferes with personal liberty and private property without due process of law the courts must be able to see that it has at least in fact some relation to the public health and that the public health is the end actually aimed at and that it is appropriate and adopted to that end. Under the guise of police regulation personal rights and private property cannot be arbitrarily invaded and the determination of the legislature is not final or conclusive." The judge continued, "The section is extremely arbitrary. It prevents the keeping of food in a cold storage warehouse by any person after an arbitrary period of ten months, regardless of the question of whether the food is fit for human use or not. The section is not necessary to protect the health of the public. The other sections of the law, namely, 338 and 338–A, gives the health commissioner all needed power to protect the public in its use of products in cold storage. These sections give the health commissioner complete power of supervision and inspection and the power to destroy food that is unwholesome. What more is necessary? If that part of the rule laid down in the Jacobs case, namely, 'and that the public health is the end actually aimed at' is still good law the section in question must be declared unconstitutional, because its real purport is not to protect the health of the people by seeing that unwholesome food products are not put upon the market, but its real reason for being is to force upon the market any products that any person may have in cold storage after a definite length of time and thus force the owner thereof to sell when the market is unfavorable and generally at a loss." Commenting on the fact that the condemnation was made solely on the grounds of the time limit and not on the condition of the goods the judge remarked, "The state offers no evidence upon the question of fitness. The overwhelming proof on the part of both defendants in question was that the food was absolutely wholesome. Evidence was introduced showing experiments that had been made with great care by the Health Department of the City of Buffalo which showed that poultry kept in cold storage was absolutely wholesome long after ten months. I do not think that the state can successfully contend that poultry properly kept in cold storage is unfit for use in ten months." Judge Noonan then summarizes his remarks and in this summary makes the following statement, "The statute is further unreasonable and arbitrary in that it makes it a penal offense to keep stuff in cold storage, where it can be kept with the greatest safety, and yet permits it to be kept by a man in his own icebox or any place that is not a storage warehouse for an indefinite length of time."

These two decisions are so in line

with the previous reports of this committee on this particular point of time limit that we have a strong feeling of remarking, "I told you so."

Another attempt has been made to pass a federal cold storage law which will embody the same objectionable time limit regulation. This bill was known as the Carey Bill. But strong opposition developed to it, however, while it was in committee and it was quietly pigeon-holed and no great effort was made to pass it.

Aside from the cold storage bills which passed and which have already been noted, there were several introduced in various state legislatures which never proceeded beyond the committee hearing stage. In every case where your committee learned of the intended legislation the reports of the cold storage committee were forwarded to the introducers of the bills and to the chairmen of the committees having charge of them. Such information as the committee had available was offered to these individuals. We believe that legislation on this important subject of cold storage is likely to be of a much saner character hereafter than some of the earlier attempts at the regulation of this industry.

Conclusion.

Your committee in concluding this progress report, while realizing the narrow limits in which it may be useful because of the fact that it is without the time or the funds to prosecute some definite line of research work or an educational campaign, desires nevertheless to urge that a similar committee be appointed to continue such work as is possible and to lend its encouragement and help to those who are in a position to carry on the work which we see is desirable and urgent. We gratefully acknowledge the coöperation and assistance given us by Dr. Pennington of the Food Research Laboratory, United States Department of Agriculture, the American Association of Refrigeration, the New England Fish Exchange, Ice and Refrigeration, and many others.

Respectfully submitted,
Wm. T. Sedgwick,
J. F. Nickerson,
Peter H. Bryce,
H. E. Barnard,
F. D. Bell, *Chairman.*

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH.

THE annual meeting of the Massachusetts Association of Boards of Health was held at the Brunswick Hotel Thursday, January 25, 1917, with the president, Dr. Frank A. Woods, in the chair.

It was voted to dispense with reading the records of the preceding meeting.

The treasurer, Dr. Francis G. Curtis, presented the following report which was accepted and placed on file:

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH *in account with* FRANCIS GEORGE CURTIS, *Treasurer.*

DR.	
Balance from 1915	$562.66
Dues for 1914	4.00
Dues, etc., for 1915	52.00
Dues, etc., for 1916	432.50
Interest	16.64
Total receipts	$1,067.80
CR.	
Printing for secretary	$60.87
For treasurer	37.00
For Committee on Incorrigible Consumptives	21.00
For Committee on Communicable Diseases	2.50
Reporting meetings	47.50
Expenses of speakers	21.33
A. P. H. A. JOURNAL	345.69
Total expenses	$535.89
Balance to 1917	531.91
	$1,067.80

Respectfully submitted,
FRANCIS GEORGE CURTIS,
Treasurer,
Massachusetts Association of Boards of Health.

On recommendation of the Executive Committee the following applicants were admitted to membership in the Association:

Dr. D. B. Armstrong, Framingham, Mass.

Miss Mae Chapin, R. N., 561 Massachusetts Ave., Boston, Mass.

Miss Helen B. Fenton, R. N., 561 Massachusetts Ave., Boston, Mass.

Dr. Francis A. Finnegan, Fitchburg, Mass.

Dr. A. G. Gigger, State Department of Health, Providence, R. I.

Dr. Thomas F. Harrington, 310 Commonwealth Ave., Boston, Mass.

Mr. Everett B. Johnson, 26 Phillips St., Watertown, Mass.

Mr. Stephen L. Maloney, City Hall Annex, Boston, Mass.

Mr. J. J. Prindiville, 59 Concord St., Framingham, Mass.

Mr. Seymour H. Stone, chairman of the Committee on Incorrigible Consumptives, reported as follows:

"The committee has presented to the legislature two bills similar to those submitted last year; one giving local boards of health the power to bring into court for commitment to the proper institution of a wilfully careless and incorrigible consumptive; the other to provide for a special institution for such persons.

These bills have been assigned to the Committee on Public Health of the legislature and are numbered House Bills 74 and 75.

The bills have been printed and about eight hundred sent to organizations and individuals, throughout the state, interested in the tuberculosis problem.

Mr. Stone further stated that last year the bills similar to these were not reported out of the Committee on Public Health of the legislature. Of the eleven members on this committee four voted in favor of the bills, three of the four being physicians. More active support on the part of those favorable to these measures is greatly needed. The members of the Association who wish to see these bills made law should make their wish known to the members of the legislature from their districts and, if possible, should attend the committee hearings on the measures.

Dr. L. E. Dionne of Ware submitted an amendment to Section 405 of Revised Laws 75 regarding the composition of boards of health in towns of a population of 5,000 or more, said amendment to require two physicians instead of one on the board. By a vote of the Association the matter was referred to the Legislative Committee.

Dr. G. L. Tobey of Clinton, chairman of the Legislative Committee, presented a report which was accepted.

It was voted that the Association authorize the Legislative Committee to employ legal counsel as heretofore and that the sum of $150 be appropriated for that purpose.

On motion of Doctor Tobey the chair appointed a committee of three, Dr. F. G. Curtis, Dr. A. S. MacKnight and Dr. E. Alden Dyer, to draw up resolutions in relation to anti-vaccination and other legislation and this committee presented the following resolutions which were unanimously adopted:

Resolved, That the Massachusetts Association of Boards of Health is opposed to any change in the present laws in regard to vaccination and that the Legislative Committee of the Association be, and is hereby, directed to oppose any legislation which may tend to modify the same.

Resolved, That the Legislative Committee of the Massachusetts Association of Boards of Health be, and is hereby, directed to favor the passage of House Bills 74 and 75.

The Nominating Committee reported in favor of the following candidates for office during the ensuing year and they were unanimously elected:

President, Dr. Francis X. Mahoney, Boston.

First Vice-President Dr. John S. Hitchcock, Northampton.

Second Vice-President, William G. Kirschbaum, New Bedford.

Secretary, Dr. Francis H. Slack, Boston.

Treasurer, Dr. Francis George Curtis, Newton.

Executive Committee:

- Mr. William L. Young, Springfield.
- Mr. Charles W. Milliken, Barnstable.
- Mr. Fred A. Bates, Lowell.
- Dr. F. L. Morse, Somerville.
- Dr. Gardner T. Swarts, Providence.

The following program was presented:

Paper:—"The Community Health and Tuberculosis Demonstration in Framingham," by Dr. Donald B. Armstrong, executive officer, Community Health Demonstration.

Discussion.

Paper:—"Industrial Health," by Dr. Thomas F. Harrington, medical deputy commissioner State Board of Labor and Industries.

Discussion.

The meeting was then adjourned.

Francis H. Slack,
Secretary.

THE FRAMINGHAM HEALTH AND TUBERCULOSIS DEMONSTRATION.

D. B. Armstrong, M.D.,
Assistant Secretary of the National Association for the Study and Prevention of Tuberculosis, and Executive Officer of the Framingham Health and Tuberculosis Demonstration.

IS IT possible to discover and to place under adequate medical, nursing and relief supervision all of the cases of tuberculosis, incipient and advanced, in a normal industrial community?

Is it possible to ascertain with some degree of definiteness the responsible social and economic factors in disease causation, including all types of morbidity, not only tuberculosis?

What is the most efficient utilization of the existing means available for the discovery and treatment of disease? What percentage of theoretically preventable disease is practically preventable with the use of known but unused or at least uncoordinated instruments? What is the best possible adjustment of social forces, existing or to be created, with the objects of the prevention of unnecessary disease and death?

Such, in brief, are the fairly ambitious questions which Framingham is attempting to solve. If the community is the logical social unit for disease prevention and control, and if the time is right for the application of a complete program for disease prevention and health creation, there is every reason to hope that, in some degree at least, answers to the above questions may be demonstrated. Obviously, the problem is not only one of tuberculosis and not only a health problem; fundamentally it is a problem of social and economic organization.

As announced in the papers and elsewhere, the Framingham Health and Tuberculosis Demonstration is being conducted under the supervision of a committee organized by the National Association for the Study and Prevention of Tuberculosis. On this committee are represented the National Tuberculosis Association, the Massachusetts State Department of Health, The United States Public

Health Service, private anti-tuberculosis organizations in Massachusetts, Connecticut, New York and Pennsylvania, and the Metropolitan Life Insurance Company, the donors of the $100,000 to be devoted to the work.

The selection of Framingham was made after several months' study of numerous communities of similar size in various parts of the United States, but particularly in Massachusetts and New York State. Framingham recommended itself to the committee because it possessed certain average qualities, being an industrial community, with mixed industries, varied racial groups, a good local health organization backed up by an excellent State Department of Health, a normal amount of disease, particularly tuberculosis, well trained physicians and good hospitals, and sufficient promise of coöperation from medical, industrial, commercial and social organizations to give reasonable assurances of success.

As indicated above, the objects of the investigation are to demonstrate what may be possible with united community action in the problem of prevention and control of tuberculosis. Inevitably the experiment, if it goes forward as planned, will broaden out into a general health demonstration concerning itself with the various disease preventive problems as they affect the several age groups, and utilizing in its effort at control all potential agencies, social, industrial, educational, medical, etc.

Briefly stated, the essentials of the demonstration, as viewed by the committee, are as follows:

1. The sympathetic coöperation of all individuals and organizations, public and private, in Framingham.

2. The execution of the program on an educational, persuasive, and democratic basis, social machinery being devised to carry the various elements in the community organization along with the work as it progresses.

3. The utilization of expert advisory service whenever feasible. This principle applies of course to general sanitary, medical, nursing, educational, school or industrial problems.

Before this audience, in presenting in the time allowed for this discussion the important phases of the program, special attention must be paid to the medical and health aspects of the plan. Consequently, only the briefest mention can be made of other significant steps.

It is of course essential that for the work a sound statistical basis be laid, involving the acquisition of data, making possible a comparison of existing conditions with conditions during the subsequent years of the demonstration, as well as a comparison between the existing conditions in Framingham, now and later, with similar conditions in other communities of similar make-up, thereby furnishing what in a sense should prove to be a control for the experiment.

The initial steps contemplated include the following:

1. The carrying out of a thorough and intensive campaign to acquaint the citizens of Framingham with the objects and methods of the demonstration, laying special emphasis on those phases of the program which

depend for their success upon the coöperation of the individual citizen. This educational work would naturally lead to efforts to present the main facts on hygienic living, prevention of disease, particularly tuberculosis, etc., the educational campaign culminating eventually in a general propaganda for thorough, universal, medical examinations for the detection of incipient and preventable or controllable cases of disease.

2. The organization of local committees of a medical and lay character, to coöperate in and advise regarding the work as it proceeds. The plan contemplates not only the organization in this way of leading influential citizens, but also the general selection, possibly on a block basis, of community leaders who will act as agents of interchange between the people themselves and the central committee.

3. An effort to encourage the Framingham health authorities to meet, through their own appropriations, the logical and legitimate routine health needs of the community, such as public health nursing, medical school inspection and nursing, general health administration, etc.

4. The efficient coördination of public and private health and charitable work.

5. A thorough study of community conditions, covering the general sanitary, rural, industrial, school, commercial and office factors, thus assisting the committee in its effort to make a diagnosis of the community health problem, and supplementing the intensive canvass to be made subsequently.

For a complete and successful use of available community agencies, it is obvious that certain mutually beneficial and coöperative relations must be established with the health and medical representatives in Framingham. On the side of health and nursing, the problem in Framingham presents no unusual difficulty. The board of health, with the assistance of private agencies, can, with minor adjustments, meet the routine nursing needs. Any extraordinary or experimental nursing or health needs essential to the working out of the program in Framingham will of course be met from the demonstration fund.

Incidentally, it may be mentioned that the demonstration budget includes funds appropriated for extra nursing service, for payments to physicians when making thorough medical examinations, for assisting town and private agencies in the provision of adequate medical nursing and relief care for both home and institution cases, etc.

In Framingham, as probably would be the case anywhere, the problems of medical organization are most fundamental and at the same time perhaps most difficult. The success of many phases of the program, including thorough medical examinations, the detection of early cases of disease, etc., depends upon the sympathy and help of the members of the medical profession. Their criticism and approval of numerous steps must be had. Uniform diagnostic standards and methods for the examination and classification of disease are essential to the scientific value of the demonstration. Not only early cases of disease, but suspected and undiagnosed cases must be gotten in touch with and classified, with the assistance of outside expert medical service. The medical work must always be done through the practicing physician, in such a way as not to interfere with the normal medical procedure, except in so far as innovations would give assurances of a higher degree of medical efficiency, and greater uniformity in methods of diagnosis and treatment.

A local organized medical agency is necessary to meet these ends. Such a medical group, or club, including in its membership all of the practicing physicians on a common basis of coöperation and service, will prove to be a useful piece of community machinery in the adoption of standards, confidential reporting of suspected cases, the use of expert diagnostic service, the approval of popular educational material on hygiene and preventive medicine, etc. Perhaps the chief function of such a medical club will be the development of a course of lectures and clinics, given by the country's first authorities, on tuberculosis and other problems of interest to the Framingham medical profession, placing special emphasis on the detection of incipient disease.

If the campaign to urge the people to go to their doctors for thorough medical examinations is a success, here again the intelligent coöperation of the Framingham physicians will be needed. Such a step of course is not contemplated in the immediate future, but would follow an initial effort to give complete care to known cases of tuberculosis, as well as any other obvious cases readily discovered through the examination of individuals in contact with known cases. In a thorough medical survey of the community, however, certain other problems will arise, if the work is to be done on a uniform basis and if it is not to be an excessive burden upon the practicing physician. The citizens of Framingham will of course be urged to pay what is determined to be a satisfactory fee for the thorough examination. If, however, any members of the community are willing to be examined, but will not meet the expense themselves, this would undoubtedly be considered a legitimate expenditure for the demonstration fund.

A thorough medical survey would necessitate the expansion of existing laboratory facilities. The health department laboratory, now doing, with the assistance of the State Laboratory, routine epidemiological work, could perhaps provide facilities for the more ordinary types of clinical laboratory work as well. Many individuals would also be discovered who would fall strictly in the dispensary class, and to meet that need, the existing tuberculosis dispensary might perhaps be expanded to include a general medical service, with an open alternating medical attendance, not only for adults but possibly for school children and factory groups. Such a service might even be placed on a pay, self-supporting basis and if such a clinic could be developed along the lines indicated, including not only tuberculosis, general medical, school medical and perhaps dental, but also infant welfare service, there would be created in the community a *health center* truly worthy of the name.

A final criterion of the success of the experiment will be, of course, the condition existing in health and medical circles, subsequent to the withdrawal of the demonstration staff. It is hoped, of course, that there may be established eventually an ideal and adequate health machinery. As a demonstration to other communities this would seem to be an essential.

Obviously, the immediate results of such a program as is briefly outlined above, if successfully carried out, would include not only a direct benefit to Framingham, but ought to involve a demonstration of the economy and social value of united community organization to meet the problems of preventable disease. It ought indeed to throw considerable light upon the most efficient methods for meeting health questions in school, factory and elsewhere. It ought also to be significant, perhaps, in its bearing upon the future of medical service in general.

The Framingham Health and Tuberculosis Demonstration welcomes your inquiries, suggestions and criticisms, standing as it does as a unique and unprecedented effort in democratic health creation. It is hoped that the work may point the way to the establishment of a hygienic basis for social organization, a physical foundation without which social, economic, and, indeed, spiritual evolution is bound to be abortive

INDUSTRIAL HEALTH.

Thomas F. Harrington, M. D.,
Medical Deputy Commissioner, State Board of Labor and Industries.

Read before the Massachusetts Association of Boards of Health, Boston, January 25, 1917.

INDUSTRIAL health is a most complex problem. It touches many interests,—medical, sociological, economic, philanthropic, scientific, as well as insurance, compensation, pensions and legislation. Modern civilization, the wonderful development of machinery and apparatus, the evolution of new industries and the transformation of old processes of manufacture have combined in bringing about such a changed condition in the environment, life and habits of the industrial workers that the whole social fabric has become involved. Social life and living conditions increase rather than lessen the appalling sacrifice of health, limb and life prevailing among those engaged in the industries. An accounting of this great loss has just been begun in this country, and many legislative bodies are deliberating seriously upon ways and means to distribute best the cost. Attempts have been made recently to consider in dollars and cents this economic loss due directly or indirectly to industrial conditions. The magnitude of this economic waste—thus computed—is almost beyond understanding. While such statistics may have some value as an argument in awakening the public to a better realization of this great wastage, nevertheless, we should not forget that the problem is one of human life and happiness—factors that cannot be expressed in dollars and cents. Furthermore, the loss is a personal one, either individual or family. No compensation, no insurance, no pension, however generous, can ever recompense for the loss of the husband and father, for the days of illness and suffering, for the discouragement, worry and discontent resulting from causes that are preventable and avoidable. Let this threatened loss affect one of our own family and how readily we make every effort to avert the blow! It is because of the growing tendency today to speak of this loss in terms of economics, collectivism, and materialism that I would urge greater consideration to the humane, the justice and the preventive aspect of the problem.

Prevention should be the keynote of all efforts to promote industrial health. There is an abundance of reliable experience and testimony to warrant the belief that a great part of the industrial sickness and a large number of deaths among industrial workers can be prevented. The complete eradication of phosphorus poisoning in the match industry in this country, of white lead poisoning in the painting trades in Europe, and the reduction of occupational diseases, injuries and deaths, where preventive measures have been followed, show some of the possibilities of this form of education against industrial human losses. The reason why these measures have not been adopted more generally in the industries is due to many causes. The chief reason, however, is probably the almost total neglect of the problem in this country. Manufacturers looked to the medical profession for leadership in such a campaign. Physicians have not been prepared for such a responsibility. Practically all our medical teaching and practice during the past forty years,—a period of unprecedented growth and development of industrial organizations—have been based upon the germ theory of disease. None of the industrial diseases—except anthrax—is due to micro-organism. These diseases are due to gases, fumes, vapors, chemical poisons, dusts of various kinds, overheated workshops, stagnant, dry or overheated atmosphere, defective lighting, lack of toilet, drinking and washing facilities, overspeeding, low wages, fatigue, job misfits, and other causes—social, economic, physical. They are not—*per se*—communicable nor dangerous to the public. State Boards of Health, having the enforcement of factory sanitation, centered attention chiefly about tuberculosis—a disease not strictly occupational in origin. Later it was observed that the increase of the mortality rate is principally among diseases of the heart, circulation, kidney and nervous systems, diseases clearly outside the communicable group and markedly prevalent among industrial workers. Whether this increase is due to industrial conditions chiefly can be learned only by further special study of the various industries, and from a more accurate knowledge of the morbidity of each branch of occupation.

The failure of the medical profession to include a knowledge of occupational environment in searching for the cause of many common as well as of baffling diseases is almost paradoxical in view of the advances made in preventive medicine and hygiene. The industrial workers, however, seeing at close range the ravages of many of these diseases among their fellow-workmen have succeeded in having enacted into laws many provisions for their own safety and for protection against conditions inimical to health. In Massachusetts this activity crystallized in 1912 into the creation of a separate state department for the enforcement of all labor laws, including those for the protection of the health of the worker in the industries, and for safeguarding against accident and injury. The work of the State Board of Labor and Industries touches at many angles the work of health boards, educational boards, public work departments as well as the work of practicing physicians. To accomplish anything worth while in the prevention of industrial sickness and accidents, or in the reduction of the present day wastage of human life and happiness among industrial workers there must be honest coöperation between all these forces. There need be no overlapping, nor duplication. There should be no misunderstanding, nor antagonism. It is no exaggeration to say that if all forces united in the humane and reasonable enforcement of labor—health laws—now on the statute books in Massachusetts, there would result a reduction in sickness, loss of life, and of poverty in this state, and a corresponding increase of happiness, efficiency and contentment far beyond the dream of the most optimistic advocates of the value of preventive medicine or social betterment.

A few illustrations may bring out clearly the possibilities of such coöperation. In 1906 a law was passed requiring the physical examination each year of every pupil in the public schools of the state. This examination specifically calls for the testing of the vision and of the hearing. In 1913 a law was enacted requiring each child between the ages of fourteen and sixteen years seeking employment to present a certificate signed by a school or family physician, or by a physician appointed by the school committee, stating that the child has been thoroughly examined by said physician, and, in his opinion, is in sufficiently sound health and physically able to perform the work which the child intends to do. Obviously, the aim and purpose of these laws were the preparation of the child for his future occupation, and secondly to prevent misfit of child and occupation. There are at the present time more than fifty thousand minors under eighteen years of age in the industries of Massachusetts. It is probably too soon to expect any marked improvement in industrial health from the workings of these laws. The possibilities, however, of making these early, regular, physical examinations a positive factor for better health in later years needs no argument. The value of good eyesight, unimpaired hearing, and a keen, active sense of coördination of nerve and muscles, was never greater than it is today. A new phrase—human efficiency—has been coined to standardize the co-efficiency of the worker with the demands of modern industrial evolution. Medical supervision of school life should mean the elimination of many defects and handicaps that are today positive obstacles to success in vocational life. With such a preparation for the industrial world the individual worker would be better equipped to meet its exacting requirements. Failures and physical shipwrecks at such an early age would be far less common than these conditions are today. Until some such standard of health is guaranteed it is neither fair nor just to charge all the present day industrial sickness to the occupational environment. There are many establishments in which hazards to health are practically *nil*, yet the number of debilitated persons surprisingly large. In other words, sickness among industrial workers is not always the same thing as sickness caused by industrial conditions. The responsibility of guaranteeing to the industries healthy recruits to the army of wage earners should be fixed definitely. Today school inspection is divided between local health boards and school authorities. The work should be centralized and standardized. The possibilities of the school hygiene branch of preventive medicine in promoting health are very great. Laws now on the statute books offer an exceptional opportunity for team work that should promise most satisfactory results in health conservation.

Another point of contact where cooperation of local boards of health and the State Board of Labor and Industries would result in much good is in the collection of reliable statistics on morbidity and mortality among industrial workers. There are no authentic data today on these subjects. Much of the statistics confuse industrial accidents, occupational diseases and sickness due to non-industrial conditions. Local boards of health are in a position to aid greatly in establishing a scientific basis for industrial morbidity and mortality.

As I look back over my experience as chairman of a local board of health in this state I recall the time and money spent in the inspection of house plumbing in our hunt for the cause of typhoid fever. I feel sure that if the inspectors had been employed in tracing back step by step the occupational hazards that lead eventually to the deaths reported from tuberculosis, arterio-sclerosis, apoplexy, heart disease, kidney diseases, nerve and mental diseases, as well as blood and digestive disturbances, there would be found in every such case a stage of ill health at which a word of caution about lead poisoning, dust infection, fume irritation, overspeeding, change of occupation or a readjustment of work to fit the physical condition would have resulted in a long postponement, if not entire avoidance, of many premature deaths. I am equally positive that the information gained by such a "follow up" would have brought me face to face with conditions of living and of occupational environment that would have made it possible to institute preventive measures that would have reduced greatly sickness, suffering, poverty, unemployment and unhappiness among thousands of fellow workers. The death return blank used today calls for a statement by the attending physician as to the contributory cause as well as the primary cause of death. By insisting that physicians furnish this information, the boards of health would establish a starting point for a basis of a comprehensive cataloging of occupational factors in morbidity and mortality of individual workers and group of workers. It would stimulate a closer study by physicians of the occupational life and duties of their patients and would create a new classification of the ætiology of many diseases. The occupational origin of many diseases would be found to be as surprising as many of the revelations of modern bacteriology and pathology. Until physicians acquaint themselves with the actual physical requirements of different branches of occupational life, and with the health hazards inherent in the various industries, the decision of the examining physicians as to the fitness of minors to enter these vocations must be more or less of a hit or a miss. To pass a girl who is defective in vision or in hearing into such an occupation as telephone operator, stenographer, sales clerk, etc., is sending her to certain failure. To sanction the entrance of a rapidly growing boy, anæmic and glandular, into an occupation of indoor life is as tragic sooner or later as permitting the epileptic boy to take up the occupation of elevator operator or automobile driver. Various labor laws have placed many safeguards against minors entering specified occupations. These prohibitions, however, are based upon the age and not upon the actual physical fitness of the boy or girl seeking employment. The State Board of Labor and Industries is prepared, by reason of its many inspections of industrial establishments each year, to coöperate with physicians, sanitarians, school and health officers in establishing standards of occupations and risk so that the worker and the work may yield greater profit of health and wealth,—the only true measure of production of labor.

In the requirement that physicians report occupational diseases to the State Board of Labor and Industries there is much need of greater appreciation by the medical profession of the great importance of this law. Several instances could be quoted illustrating the advantage to workers, employers, and to the community that have occurred within a year in this state from the information gained through this law. A few illustrations will bring out more strikingly this advantage:

A report called attention to a death from what was alleged to be arsenic poisoning contracted in handling leather. An autopsy was secured and a post-mortem diagnosis of anthrax returned. An investigation showed that the man had worked in the hold of a vessel laden with dried blood, ground bones and phosphate, and had subsequently assisted in unloading a cargo of hides. The hides were traced to a tannery, where it was learned that hides were being imported from infected districts in China, India, Africa, Brazil and Argentine. These cargoes formerly went to England. Instructions to local physicians and tannery operators resulted in the detection of some thirty cases of anthrax with seven deaths during the year. The seriousness of this outbreak is evident when it is recalled that England has found it necessary to maintain for several years a permanent commission on anthrax. The average number of cases of that disease, however, in England from all sources—infected wool, horse hair, hides, skins, etc.,—is thirty-five, with an average death of six or seven cases a year. An active coöperation was established between the State Board of Health and the State Board of Labor and Industries, which has resulted in a more rigid and systematic disinfection of all imported hides, and a closer watch over interstate transportation. The investigation brought out further the fact that there is no law protecting against interstate transportation of infected hides. A set of rules and regulations has been issued by the State Board of Labor and Industries, setting forth the causes, sources and prevention of anthrax. These activities have resulted in a better knowledge of this disease and have been the means of improving greatly the working conditions in tanneries and leather factories.

Another group of serious conditions brought to light through reporting occupational diseases was gas and fume poisoning:

A chemical manufacturing company recently established in the state for the preparation of benzene derivatives, such as nitro-toluene, trinitro-toluene, nitro-benzol, phenol and picric acid attracted the attention of the board through a report that an employee had died because of some mysterious poisoning. An autopsy was secured and a diagnosis of accidental gas poisoning returned. By a coincidence a second employee died the following day. An autopsy agreed in its findings with the previous case. Neither case had been reported antemortem because the interval of two or more days of apparent good health between the attack of the illness at the works and fatal termination seemed to exclude gas poisoning as the cause of death. This misleading interval of good health is one of the characteristic signs of poisoning by the benzene derivatives that were being manufactured. The interest created among local physicians and hospital authorities by these cases, and their investigation, has resulted in a collection of reports of occupational diseases due to benzene derivatives and other gases and fumes not heretofore available in this country. Some of the cases are not mentioned in American textbooks on occupational diseases. Forty-five cases with thirteen deaths have been reported during the year. Rules and regulations for the prevention of poisoning by chemical agents of this nature have been issued by the State Board of Labor and Industries to the various establishments where chemicals, dyes, gases and explosives are being manufactured or handled.

These rules include medical supervision, hospital accommodations on the premises, suitable first aid rescue apparatus, etc.

The construction of subways in Boston brought into prominence caisson disease, resulting from working in compressed air. The first case was a non-English-speaking Italian, who was taken ill on the street car. He was semi-delirious and was thought to be intoxicated. His pain was agonizing. The conductor took the man to the hospital; large doses of morphine failed to relieve his suffering. The police reported that the man worked on a subway job. Inquiry at the tunnel demonstrated that cases of bends were common and the workmen accepted the disease as a necessary part of their occupation. Conference resulted in placing the work under strict medical supervision, including a thorough physical examination of the men and the establishment of a suitable decompression medical lock for the immediate treatment of the men attacked by the disease. A set of rules and regulations governing working conditions under different degrees of compressed air has been adopted, since which time there has been an almost entire freedom from serious illnesses among the workers. Thirty-five cases of caisson disease have been reported during the past year and a half.

Many interesting illustrations of the value of reporting occupational diseases could be furnished, if time permitted, from the list of cases of lead poisoning, brass poisoning, wood alcohol, occupational neuroses, dermatitis, etc., that have been accumulated during the past year. Sufficient has been presented to make it clear to even the most skeptic that occupational disease is a real problem in industrial health.

The last point that I would emphasize, touching coöperation of local boards of health and the State Board of Labor and Industries, is what we have termed "Rules and Regulations for Toilets in Industrial Establishments." These rules have all the force of statute. They define specifically the requirements as to number of toilets for each sex, and location, ventilation, lighting, construction, etc., of toilets as well as the requirements for washing facilities. The enforcement of these rules is doing much to relieve communities of the privy type of closet, and of river and stream pollution. There is, perhaps, no one factor that makes for better industrial health than the adequate, suitable and convenient facilities for toilets and for washing in the workshop, the factory and the store. Of like importance is the question of a supply of pure drinking water, especially in overheated and dusty workrooms.

The foregoing represents some of the opportunities for the coöperation of agencies having for their object the promotion of individual as well as of community health.

To secure for the great army of wage earners in this state some degree of industrial health is the duty and the responsibility of no one department nor individual; it is a work of humanity and justice in which all can share.

DISCUSSION.

Professor Sedgwick: I am very glad that Doctor Armstrong has brought this interesting paper before the Association. It is a matter of pride for us all that the first place chosen for such an experiment should be in Massachusetts, and it is of vital importance to Doctor Armstrong that the closest possible coöperation should exist between his work and our state, municipal and town boards of health. The experiment will be watched with the keenest sympathy and I am sure that every member of this Association will do his utmost to make it successful.

It is easy to attack a new undertaking; there are always an abundance of "knockers" and critics, but I believe the promoters of this interesting attempt to control tuberculosis in one community may be assured of the cheerful and hearty coöperation of the Massachusetts Association of Boards of Health.

Tuberculosis is always with us and for that reason it is tolerated. We have become accustomed to it, and because it is not more frightful, because it does not assume such terrible aspects as Asiatic cholera or the plague we tolerate it. It is the good (?) old-fashioned consumption of which our ancestors died, and with which, perhaps I ought to say, they unfortunately lived.

We tolerate it, and this very tolerance is one of the hardest things we have to deal with. Now in a Massachusetts community we are going to try to educate the people to intolerance of tuberculosis. It is all mighty interesting and we are all going to watch the experiment with the greatest interest, and help it all that is in our power.

I was also interested in Doctor Harrington's paper dealing, as it does, with a subject of so much importance to a state where so many people are engaged in industrial pursuits.

I have an axiom that "every industry should sanitate itself,"—that is, it should take care of its workers and its waste products in such a way that there would be from them no menace to the public health. I believe we ought to extend this idea to cover the wage earner and require that every industry should help to keep its workingmen in reasonable health. If an industry cannot sanitate itself it is a question if it should be tolerated. It is time we had a higher state of industrial health, and the State Board of Labor and Industries is, I believe, doing good work along this line.

Doctor Dionne, *Ware:* I would beg leave to relate a case which came under my observation and which may serve to illustrate the need of the work so ably described in Doctor Armstrong's paper.

A few weeks ago a man 26 years of age called at my office. He was married man with one child; with a wife in advanced pregnancy. He came to Ware from Hartford and he told of the amount of money he had spent to get a cure for the chills he suffered from and which he termed "malaria chills." He had visited the X-ray men mostly and said that he paid them over $150, and that all had envied his "strong lungs." Albeit, I found him to be in the last stage of pulmonary tuberculosis. He was without means, he had worked to that very day, and as he was a state case, I tried to have him admitted at the Rutland Sanatorium, but I found he would have to be placed on the waiting list, and as his condition was too urgent to wait for formalities I consulted with Doctor Perry of the Hampshire County Sanatorium and through his genial spirit of endeavor, I obtained immediate admission for my patient. Exactly five weeks from the date of admission he died.

Now this poor man, for nine months prior to his death, worked in one of our largest manufactures and his condition was not discovered. It could probably have been easily detected at least two years before and his misery diminished if his life could not be spared.

I was under the impression that the state inspectors were supposed to be on the lookout for such conditions and that they were not allowed to exist.

On the industrial side of the question I say that one of the oldest principles of philosophy is *primo vivere.* The obligation of living first imposes itself more forcibly upon those who feel that their loved ones depend on their daily labor for daily bread, and it is lamentable that so many must work on such inadequate salaries. Before we can do much to conquer tuberculosis we must obtain living wages for the men who toil. When a man has to support six or eight children, his wife and himself on a salary of less than $12 per week he must look for the quantity rather than quality in his selection of food and he unwillingly prepares the ground for tuberculosis. A man should not be required to work until within six weeks of his death when he is suffering with a pathology so chronic as tuberculosis, and this is true for his own good as well as for the protection of his associates. Such a person will cough and expectorate to the danger of others and the employer should be obliged to report such cases to proper authorities. My case marks one of the occupational misfits so masterly elaborated by the last reader.

It is also deplorable that it takes so much time to enter a tuberculosis patient into a state sanatorium. My patient was a state case and yet he had to be placed in a county sanatorium, at a loss of two dollars per week, as the state subsidies cover but $7 weekly.

DOCTOR VOSS, *Beverly:* I agree with the previous speaker that a living wage for industrial workers is of the greatest importance. We all know that tuberculosis is a disease of malnutrition and that it is fostered by conditions of poverty and want.

The loss of life through preventable accidents and through preventable disease is frightful.

In arsenical poisoning, lead poisoning, mercury poisoning and phosphorus poisoning it is very easy to place the blame where it belongs, but in tuberculosis it is a question how much of a factor in the causation of the disease the industry is.

One thing is certain, we must have a radical change in the living condition of the families of many of our workingmen before we can progress far in stamping out tuberculosis.

DOCTOR HARRINGTON: In answer to Doctor Dionne's question as to the duties of state inspectors, I would say that minors employed in industries may be examined whenever it is deemed advisable or necessary, and the inspector shall call the ill-health or physical unfitness of any minor to the attention of his or her parents or employers and of the State Board of Labor and Industries. In the case of adults, however, there is no jurisdiction, except the general jurisdiction of the board of health over tuberculosis and other communicable diseases.

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Book Reviews

Public Health Nursing. *By Mary Sewall Gardner, R. N. The Macmillan Co. New York. 1916. Pp. 364. Price, $1.75, net.*

To all actively engaged in the public health work of today, whether in an advisory, executive or subordinate position, there come hours and seasons when the intricate mass of detail weighs heavily, when political, financial or sociologic difficulties confound and exhaust and when one's true relationship to the work and community, of theory to unit seem hopelessly obscured.

Especially is this true of those branches of the work, in which development has been most rapid and rich in promise. No agency at the command of the sanitarian, has undergone such rapid evolution as has that designated in the title of Miss Gardner's work. For this very reason the busy executive, the army of nurses themselves, to say nothing of the public for whom the work is done, have too frequently lost sight of the significance of the movement.

To some—the few—it has come simply as a natural outgrowth of the increasingly prominent part that woman, today, is playing in public affairs. Others have been quick to realize its true and correct relationship to modern preventive medicine, unit responsibility, and hence individual knowledge and coöperation versus legislative or police control. The public health nurse has, more than any other agent, fostered the new public health and in the clarity that she has brought to departmental and community relationships, she has served to demonstrate the soundness or unsoundness of many health tenets of our time.

In "Public Health Nursing," the author has presented a masterly concept of the sphere of the nurse in health organization. She has, however, done much more than this, she has visualized, to even the most casual reader, the best in health endeavor.

In the two chapters devoted to the history of public health nursing she has wisely selected the significant only, from a mass of material that afforded every temptation for too lengthy treatment.

The basic principles of the movement are clearly defined and the difficulties in the way of the most efficient execution are most impartially handled and in such wise as to temper hasty conclusions and stimulate just consideration and further inquiry.

Full of wise counsel is that portion dealing with the organization of health nursing activities and it is a safe statement that these chapters furnish the most practical assistance to all contemplating the establishment of such health agencies.

The chapters on the special branches of public health nursing, while not burdened with needless detail, are full of stimulation both to the student and the executive and form a valuable placement of each subject in the whole of sanitation.

No portion of this work, however, is more striking or valuable than Miss Gardner's presentation of the relationships that should exist between this newest agency and the entire health organization and between the various members of the service itself. The vision that is evoked, in the reader's mind, by her highly sensitive views and keen appreciation of relative values and viewpoints, is one that may not fail to inspire the most indifferent to interest and the zealous to rare sacrifice.

To the health official and the nurse, seeking the best in health achievement, as well as to the layman, interested, as so many are today, in the sanitary progress of his community and the socio-economic side of disease, Miss Gardner's book is unhesitatingly recommended.

C. E. Terry, M. D.

The Prevention of Disease. A Popular Treatise. *By Kenelen Winslow, B. A. S., M. D. W. B. Saunders Company. Pp. 337 1916. Cloth, $1.75, net.*

This is another of the now considerable number of books intended for popular consumption that have recently appeared. It is a good one. The author has wisely declined to subtitle it a treatise on personal hygiene or anything of that nature, because the range of subject-matter, while always considered from the standpoint of the non-medical individual, goes far beyond strictly personal hygiene. This feature is particularly true in the three brief but unusually sound chapters on "germ diseases" and the chapters on the prevention of cancer, and prevention of venereal and mental diseases.

An unusual feature of the book are the all too brief introductory notes to certain chapters, contributed by authorities of world-wide repute; for example, by Bloodgood of Baltimore in the chapter on cancer, and by Goldthwaite of Boston in the chapter on prevention of deformities.

The general style of the book is very clear. The assertions are at times somewhat dogmatic, but in nearly all instances where any such statements are made they rest upon either conclusive scientific evidence, or upon the overwhelming majority opinion of the medical world.

Probably the author would deny any personal literary style. Nevertheless, interspersed through the brief, business-like sentences are allusions with an ironical twist which enliven the general subject-matter and incidentally give a clear picture of the personal views of the author on some hotly disputed points of hygiene. For instance, from the following sentence it is safe to conclude that he is not strongly impressed with vegetarian dietary views: "Herbert Spencer had to rewrite a book first written while he was on a vegetarian diet."

There are a few statements scattered through the book which are liable to challenge, such as "Four per cent. of typhoid convalescents become 'carriers.'" "Water and milk are the chief sources of typhoid."

Certain chapters are particularly worthy of commendatory comment. One of them is the chapter on "Cancer" with the admirable classification preface by Bloodgood. In this chapter are collected in most telling fashion the terrible statistical showing of the disease as a whole, and the statistics of delayed and early operations in striking contrast. Another unusually good chapter with a felicitous title is the one on "Local Troubles as a Source of Serious Disease," under which skillful disguise the adenoid, tonsil, and dental caries lesson is reiterated in simple, clear fashion.

The chapter on "Venereal Disease and Sex Hygiene" presents that difficult subject in an unusually common-sense fashion, happily steering a middle course between the Scylla of emotionalism and the Charybdis of genito-urinary pathology, upon one or the other of which so many well-intentioned sex hygiene reformers have come to grief.

Full of terse practical advice for the middle-aged is the chapter on the prevention of the degenerative diseases of the cardio-vascular-nephritic group.

Another chapter that is particularly valuable for the non-medical reader, and especially for parents, is the chapter on the prevention of deformities, which is illustrated with simple, easily understood diagrams.

Altogether the book deserves almost unqualified commendation, and in nothing perhaps so much as the complete absence of sensational statements. It is a book that the thoughtful teacher or parent can read with ease, in not too long a time, and will find full of sane, interesting information put in the simplest of language, but also giving a clear idea of the very latest advances in matters of hygiene and disease prevention.

Eugene R. Kelley, M. D.

Health Department Reports and Notes.

REPORTS.

East Orange, New Jersey.

In many respects the 1916 Annual Report of the Health Department of the City of East Orange, whose splendid activity in recent years has placed it well up among our most progressive health organizations, is refreshingly novel, and it is evident that the report has been constructed with such forethought that it has risen far from the rut to which so many health department reports cling.

The registration of vital statistics has been carried to a high degree of refinement and much effort has been expended in securing all out-of-town births and deaths of East Orange residents. If these were not secured it was estimated that an error of 20–25 per cent. would enter in the vital statistical records. This is indeed apparent when one considers that in 1916 23.8 per cent. of the total number of births among East Orange residents were out-of-town births, and 21.7 per cent. of all deaths took place out of town. The 1916 population of this city was 42,279. The birth-rate of 18.2 per 1,000 showed a slight increase, and the death-rate of 11.8 was 1.0 in excess of the three-year average 1913–1915, an increase which can no doubt be attributed to the thorough searching of out-of-town deaths.

Organic heart disease, pneumonia, apoplexy, cancer, Bright's disease and tuberculosis were the six chief causes of death and caused 57.1 per cent. of total deaths; all increasing in 1916 with the exception of cancer. It is interesting to note that the list of all the deaths of the year arranged according to the cause is not incorporated in this report though naturally kept on record in the department's office.

Measles and chickenpox outbreaks in the spring and the well-known infantile paralysis epidemic of the summer are the predominant features among the communicable diseases of the year. Grippe and pneumonia, which unfortunately are not reportable, caused much sickness and many deaths during January, February, and December. The number of tuberculosis cases is slightly above normal, but whooping-cough, scarlet fever, diphtheria, and typhoid fever are far below the averages for the previous years for which records have been kept. An effort has been made to show these facts clearly by diagram.

The anti-tuberculosis work of the Anti-tuberculosis League of the Oranges has been made more effective during the year by the employment of a second nurse. This was made possible by an increased sale of Red Cross seals. During the year 82 new cases were reported, 5 less than in 1915, but 21 more than the average for the previous seven-year period, caused no doubt by the much improved reporting of cases. Eighty-three per cent. were of pulmonary tuberculosis. Thirty-six deaths from this disease are recorded. East Orange did not suffer to the same extent from infantile paralysis as did her neighbors. Fifty-six typical cases were reported, resulting in 10 deaths, giving a death-rate of 2.4 per 10,000 population. The experience of this city leads the department to believe that this dread disease is "absolutely contagious, and that it is spread by the unrecognized cases and, very probably, by adult carriers." Particular stress was laid on the value of the lumbar puncture for diagnostic and treatment purposes, and on the importance of hospital care. Ten deaths and no more than eight cripples were the direct result of this disease in this city.

The clinic at the Orange Memorial Hospital for the treatment of venereal diseases has been continued in coöperation with Health Departments of the other Oranges, and a marked increase in the number of patients shows the growing value of this work.

No increase in the infant mortality was noted, a rate of 62 per 1,000 births, the same as for 1915, being reported. This low rate, however, was not accompanied by a correspondingly low death-rate of children between 1 and 5 years of age. Thirty deaths among this age group were reported, doubling those of the previous year. The Oranges were fortunate last year in having no serious epidemics of milk-borne diseases occurring. The tendency of this group of cities, whose milk is under the supervision of the Joint Milk Committee of the Oranges, is to eventually allow only that raw milk into the city which is certified.

As with all cities, many of the complaints of nuisances which are received by the health department have no relation to health whatsoever, and it is hoped that such conditions will improve, so that more advantageous work can be done in other lines. Plumbing, it is hoped, can soon be transferred to the building department, though efforts along this line during 1916 met with opposition. The recommendation of the health department of last year for the equipment of a laboratory was adopted, and its installation has proven a good investment.

Among the several recommendations contained in this excellent report is one calling for a Public Health Bulletin for the city. It is felt that "the great work of the modern Board of Health is education, and the issuing of popular reading matter is realized to be the best way of accomplishing the result."

The report is concluded by the financial statement which shows the per capita health expenditure of this city to be 21 cents per year, comparing most unfavorably with the surrounding cities. Only 79 per cent. of the annual appropriation of East Orange is directed toward the improvement of its health. Yet so wisely has this small amount of money been expended and so well has the health administration been regulated, that the activities of the department under the able direction of Health Officer John Hall have assumed a most commendable high standard of worth.

Columbia, South Carolina.

One of the earliest 1916 reports received is the Annual Report of the Health Department of Columbia. This city reports a resident death-rate of 14.97 per 1,000 population. Of the 519 deaths occurring among the 34,611 inhabitants, 217 were white and 302 negroes. The non-resident deaths are not reckoned in this rate because it is felt that such is unjustified because of the location in this city of the State Hospital for the Insane which contributed 348 of the 454 non-resident deaths. The white death-rate, based on a population of 19,878, is 10.91; the colored death-rate, among 14,733 negroes, is 20.50. The combined death-rate is the lowest ever reported in the city; the 1915 rate being 19.65, and the lowest rate heretofore, 15.63 in 1911. Of the 134 fewer deaths in 1916 than during the previous year, 108 represented a decrease in deaths of negroes—a reduction of 27 per cent. This is accounted for by the intensive campaign made by the sanitary inspectors in the negro quarters. Deaths from typhoid, pellagra, tuberculosis, organic heart disease, and cancer deceased during 1916, particularly in the case of tuberculosis and pellagra, though the reporting of tuberculosis is by no means complete.

It is recognized that the infant mortality is too high. During 1916, 16.76 per cent. of the total deaths were of infants under one year, while 26.96 per cent. were of children under five. Every effort is being made during 1917 to reduce these percentages.

Though typhoid cases dropped from 120 with 17 deaths for 1915 to 67 cases with 12 deaths in 1916, no let-up in the campaign on the unscreened surface closet and the ever-present fly will take place, and it is hoped as a result that the too high incidence of this disease will be diminished. Diphtheria gave the lowest morbidity rate in the city's history, 31 cases being reported. This is no doubt due to the practice of culturing diphtheria contacts, a procedure instituted in October, 1915.

The sanitary engineering division of this department has been exceedingly active and much of the improvement in the sanitary conditions in this city as evidenced by this report can be attributed directly to its efforts.

Evanston, Illinois.

The tendency of making health department reports mean something to the average citizen is increasingly obvious as the 1916 Annual Reports come to hand. The point is well illustrated by the 1916 Annual Report of the city of Evanston, Ill., which compares with its own records the records of other cities of its size in the country, in this case Orange, N. J. and Colorado Springs, Col., also with its large neighbor, Chicago. Evanston reports a death-rate of 9.18 per 1,000 for its population of 34,000 (non-resident deaths excluded). Pneumonia was the chief cause of death, causing 32 deaths. Deaths from tuberculosis were reduced from 21 in 1915 to 14 for the reported year. Birth reports are considered accurate. In this connection, for every birth report and death report sent into the state capitol, a fee of 25 cents is allowed, which this year will increase this city's health fund by $280.

Through the efficient sterilization of the city water and an efficient milk supply supervision not a single case of typhoid fever was reported. Since 1911 the decline in the number of cases of this disease has been constantly sustained. The incidence of contagious diseases compares favorably with the previous year with the exception of scarlet fever, which became quite prevalent during the spring and fall of the year. It is curious to note, however, in this connection that the first cases reported were not among school children but among adults travelling back and forth to Chicago.

The public health laboratory of this city has been most energetic. One interesting table, after taking all considerations into account, shows conclusively the excellent improvement in the milk supply of this city for the last five years. The percentage of analyses having the lower bacterial counts have steadily increased, while the per cent. running in the higher counts have steadily decreased. In 1916 of 127 samples of pasteurized milk, 77 per cent. showed counts under 100,000.

Though the laws of the state do not make vaccination a prerequisite for admission to school, the occurrence of a case of smallpox in one of the public school teachers is hoped to afford a powerful weapon for the pleading of such an ordinance to be passed.

It is to be regretted that this otherwise excellent report does not seem to attribute sufficient importance to infant mortality. In fact scarcely any reference can be observed to this phase of the health department's work. Medical inspection of school children, and the careful control of contagious diseases, notwithstanding the existing unsatisfactory quarantine regulations, as well as school hygiene have been carried to a high degree of efficacy. The reports of the other divisions, particularly that of Food and Dairy Inspection and Sanitary Inspection indicated that they have effectively coöperated to make the year 1916 a most favorable year for this city's health.

NOTES.

Milk-Borne Typhoid Fever.—There is published in the January *Monthly Bulletin* of the New York City Department of Health an instructive article by Dr. G. F. Nicholas, Chief of the Division of Epidemiology, on the application of a new epidemiological procedure in detecting the source of infection applicable to such outbreaks as are due to milk-borne infection.

Early in the present year this division undertook the study of typhoid fever as reported from the various rural sections where shipping stations sending milk and cream to New York City were located—the so-called "milk shed" of this city. The plan involves the tabulation by states and counties of all such localities, and entering against each locality its typhoid fever record for a number of years back, also whatever other details available. By this means attention is called to localities having a bad typhoid record, a condition which would indicate constant sources of infection, which leads in turn to a special scrutiny of any milk stations located in such a territory.

Doctor Nicholas describes the twofold value of this new procedure. First, it primarily is designed to help control typhoid infections in that city. Secondly, it exerts an educational effect also on the rural community involved since it makes them realize that it costs something in more ways than one to go on having typhoid fever year after year.

The following example of the working of this new procedure is cited:

"Thus, a certain village with a population of only some two hundred and seventy-five, shows a record of one, two or three cases of typhoid fever year after year for the past eight or ten years. This locality supports a milk pasteurizing plant shipping from eighty to one hundred cans of milk daily to New York City. This milk is retailed as 'loose' or dipped milk. In that part of the city where it is sold there is a sharp rise in the number of cases of typhoid fever. Within a very few days the reports of investigators show two or three instances in which the milk in question was used. Taken together with our knowledge of conditions at the source of this particular milk supply, this justifies the exclusion of the milk forthwith. The supply is accordingly excluded, whereupon the city outbreak comes promptly to an end. Investigation at the pasteurizing plant discloses abundant chances for contamination, both in the way of possible 'carriers' among the employees, and in a water supply with a high colon bacillus count. As additional cases in the city outbreak come to light, it is found that more and more of them had used this milk."

The two points strongly emphasized are: the value of the procedure as a means of recognizing the source of milk-borne outbreaks of typhoid fever; and that the procedure will cause the source of contamination to be disclosed at an earlier date. That this procedure is not applicable to localities shipping milk which is effectively pasteurized at some central pasteurizing plant in the city is obvious.

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"**The Fate of Venereal Notification in England.**—It is easy enough for enthusiastic reformers to advocate legislation to do away with their pet evils. It is harder to get such legislation passed; even if this difficulty be surmounted it may be impracticable to enforce the law, and even when this has been done it is sometimes found that the situation is not at all ameliorated. Thus it is with the societies for the suppression of vice, and kindred bodies who would prohibit prostitution, make the notification of venereal diseases compulsory, punish all sexual delinquents, and by divers other legal aids place the feet of the populace in the strait and narrow way and see that they march therein.

"In England there has lately been an agitation to make the notification of venereal diseases compulsory and the British Medical Association appointed a committee consisting of the chairmen of all standing committees to consider what should be the attitude of that body in the matter. It is significant that this committee, after careful consideration of the subject, arrived unanimously at the conclusion that such a system would be unfortunate. The main two objections found by the committee were that such a law would lead to concealment of venereal diseases, and that, even if notification were made, this would not help any in the treatment of such disorders.

"The British Medical Association is of the opinion that there are two indispensable preliminary steps to such a law. First, facilities should be provided by the community so that the suffering individuals may be assured of proper treatment, regardless of their financial condition. Second, that charlatans should be put out of business by directing heavy penalties against the advertising of quack nostrums and the attempt to treat venereal diseases by unqualified or incompetent persons.

"These delays may seem intolerable to the headlong fanatic who would legislate all these diseases out of existence, but the thoughtful medical man will agree that some such approach to the problem presents more promise of success than mere punitive measures."—*New York Medical Record*, February 10.

✠

Chicago Prepares.—The first steps in the campaign of prevention against a possible threatened outbreak of infantile paralysis in Chicago and the nearby cities during the coming summer was recently taken. The meeting was called in accordance with a request issued by Mayor Thompson, and is described by the February 17 *Weekly Bulletin* of the Chicago Department of Health. The meeting was presided over by Health Commissioner Robertson, and was attended by representatives from the various civic and medical organizations of Chicago and environs. It is interesting to note that the Police Department was represented by the Chief of Police and all of his police captains. The Superintendent of Streets together with the ward superintendents and nearly 100 physicians and social workers were in attendance. As a result of the meeting an association for the prevention of infantile paralysis was organized with fourteen working departments. Funds will be contributed by the various municipalities interested, and if found necessary, private subscriptions will be solicited. Among the principal activities outlined at this meeting are preparations for a vigorous campaign along sanitary lines against dusty streets, dry cleaning, filth covered vacant lots, insanitary milk depots and food establishments of all kinds. It is stated that an element of hope was introduced into the meeting by Dr. Maxmilian Herzog, Chairman of the Committee on Research at the Cook County Hospital, who informed the meeting that by next summer he hoped to have an effective serum against this disease. He hopes to be able to develop a serum from an antitoxin that had been found in a measure effective in sheep and horses. Dr. C. T. Roome, Health Officer of Evanston, Ill., urged the importance of careful diagnosis. Dr. W. A. Evans brought out the additional point of the standardization of symptoms to help in such diagnostic work, in order that prompt removal and hospitalization of suspicious cases might be enforced. Dr. John Dill Robertson was elected chairman of this organization and the many other officers both of the organization and of its many committees give proof of a general municipal representation.

A Still Lower Typhoid Rate.—In 1915 the California State Board of Health declared its intention to reduce the typhoid fever death-rate from 13.6 per 100,000 population (the rate for the year 1914) to 9.6 per 100,000 population in 1918. As a matter of fact, however, this declaration was nearly fulfilled in the year 1915, when the rate was reduced to 9.7 per 100,000 population. And now, the typhoid death-rate for 1916 is 7.1 per 100,000 population, lower than the board hoped it would be in 1918. If the measures employed in typhoid fever control are continued and if the same coöperation of the people of California is received, the board hopes to reduce the typhoid death-rate to a point below 5.0 per 100,000 population in 1918.

This may be accomplished through the prevention of the sewage pollution of public and private water supplies; the insurance of safe milk supplies through the pasteurization and inspection provisions of the state milk law; investigation of outbreaks of typhoid fever, determining and removing their sources; manufacture and distribution to physicians of typhoid vaccine; inspection of hotels, eating places, summer resorts and surroundings, correcting insanitary conditions that may be present; enforcement of laws and of the board's regulations for the prevention of typhoid fever; and by education in the prevention of typhoid fever.

If the high rate of 1906, 32.2 per 100,000 population, had prevailed in 1916, there would have been 950 deaths from this disease. There were but 208 typhoid deaths in 1916, however.

In order to secure these results, it is necessary that the California State Board of Health shall have the active support of health officers, physicians and citizens. All of the common rules of sanitation, particularly as related to sewage disposal, water and milk supplies, must be rigidly observed. The regulations of the board for the prevention of typhoid fever should be carefully followed by physicians and health officers. With such coöperation, California may soon have one of the lowest, if not the very lowest typhoid death-rate of any state.

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City Schools to Teach Health.—The City of Kenosha, Wis., is to take the lead of all cities of her class in the nation, in announcing recently that the health department of the city and the department of public schools will coöperate in the establishment in the schools in Kenosha of courses in sanitary instruction and hygiene which are to be open to any citizen in the city. The course will not only be open to any citizen in the city, but the superintendent of education and the commissioner of health have decided to give the children such portions of the proposed work as will be comprehended by them. The idea is to assist them in understanding better the reasons for protecting their own health and the need of coöperation in handling all questions of health and sanitation. Not only is it thought that this new project will be of great value to the children but also to all citizens. It is believed that the following subjects may be profitably taught the children: Contagious diseases, the rôle of the laboratory in health promotion, ventilation, garbage, sewage, water disinfection, and fumigation. The synopsis of the course as worked out by the two departments is as follows:

1. Contagious diseases. 2. School inspection. 3. Physical examination of school children. 4. Infant welfare field work. 5. Summer baby camp. 6. Laboratory (microscopical, chemical, bacteriological). 7. Inspections (meat, milk, food, sanitary). 8. Office administration. 9. Vital statistics. 10. Research. 11. Ventilation. 12. Garbage. 13. Sewage. 14. Water. 15. Disinfection and fumigation. 16. Publicity and education. 17. Funeral inspection. 18. Social welfare. 19. General preventive medicine. 20. Health ordinances.

In writing relative to this project, Health Officer H. L. Wright of this city states that "while we realize the fact that it is quite an undertaking, yet we expect to accomplish results and lay something of a foundation for the future."

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Health Protection in the Sunday School.—The enforcement of the law applicable in the public schools to the effect that a pupil absent for a certain number of days, before being admitted to the classroom must present a medical certificate stating that his absence during this time was not caused by a disease of communicable nature, has been of material aid in keeping down the number of cases of communicable diseases in the public schools of Chicago, and too, of other cities no doubt. The same rule should apply to other classes of schools says the February 3rd *Bulletin* of the Chicago Department of Health. It must indeed be pleasing to this department to be able to announce that at a recent meeting of the ministers of Chicago the following resolution was passed by unanimous vote: "Resolved, that the superintendent of each Sunday School, or a committee which may be appointed for that purpose, investigate carefully the cases of pupils absent in case of sickness, either themselves or members of their family, ascertain the cause thereof, and prevent a too hasty return to the Sunday School."

"There can be no doubt" states this bulletin, "but that this is a step in the right direction, and it is hoped that the clergy and Sunday School superintendents throughout the city will fall in line and do what they can to see that the rule is enforced. It is a measure along the lines of conserving public health and one that should have the active coöperation of every good citizen."

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Connecticut Proposes Reorganization.—"The infantile paralysis outbreak of last summer and the widespread smallpox epidemic with which we are now threatened, have emphasized the urgent need of more adequate organization for the protection of the health of our citizens. . . . What is needed is the reorganization of our state health machinery so that the State Board of Health may be strengthened and placed in a position to furnish to the local health officer the advice and moral support which he needs. I urge earnest consideration of this question, with a view to a remodeling of our state health laws, and that you make an appropriation for the State Board of Health sufficient to give our state a health administration adequate for modern needs," were part of the encouraging remarks relating to the health of the state made by Governor Holcomb in his inaugural message as printed by the January *Monthly Bulletin* of the Connecticut State Board of Health. This *Bulletin* further reproduces a diagram of the proposed organization of the State Department which well coincides with the most advanced ideas of public health administration.

The suggested legislation needed to accomplish this plan will authorize the State Board of Health: (a) To adopt and to secure the enforcement of uniform sanitary regulations throughout the state, (b) to divide the state into four sanitary districts and to appoint deputy state health officers as supervisors, (c) to appoint and define the duties of directors for the bureaus of sanitation and sanitary engineering and preventable diseases, (d) to appoint certain local health officers and to define the duties and relationships of all appointees and health officers, (e) also, legislation permitting the consolidation of towns or towns and cities for the purpose of securing the services of a full-time health officer with the privilege of selection, (f) to carry out the provisions above cited, the appropriation of the State Board of Health must be increased about $30,000, an increase of 2½ cents per capita.

The following brief effective advice is given by the *Bulletin* to its many readers: "Deprive yourself of one trolley ride or one cheap cigar and the nickel saved will pay your share of the cost of state health work for a whole year."

✢

Whooping-cough.—The January *Quarterly Bulletin* of the New Hampshire State Board of Health strikingly substantiates the claim that three times as many persons die from whooping-cough as from scarlet fever, and twice as many as from measles, by publishing the death returns from these three diseases of childhood during the past eleven years.

Such a record is as follows: 355 deaths from whooping-cough; 184 deaths from measles; and 122 deaths from scarlet fever.

Barring fractions, this gives an average annual mortality of: 32 deaths from whooping-cough; 16 deaths from measles; 11 deaths from scarlet fever.

Of the 355 deaths from whooping-cough: 255 were under 1 year of age; 93 between 1 and 5; 5 between 5 and 10; 2 above 10 years of age.

The general public, states this *Bulletin*, is apparently oblivious to the fact that whooping-cough is a most dangerous communicable disease, and it further deplores the "reprehensive neglect" on the part of the public in connection with this disease.

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Swimming Pools Should be kept Sanitary.—Public swimming pools should be kept in the most sanitary condition, in order that they may not be sources of disease infection. The California State Board of Health is interested in the relation of such places to the spread of communicable disease, and desires that all public swimming pools and bath houses be placed under the board's supervision. Not only should the water in these pools be of unquestioned purity, but the bathing apparel and towels should be cleaned, dried and stored in a sanitary manner. Life saving apparatus should be provided and measures to insure the safety of bathers should be adopted. The personal cleanliness of bathers should also be required.

During the past summer, several cases of communicable disease, undoubtedly contracted in public swimming pools, came to the attention of the board. The need of the sanitation of such places is apparent and it is proposed that all public swimming pools be required to operate under a permit from the board. A bill, in which adequate provision for the safety of the bathing public is made, is now before the legislature. Under the proposed measure, every necessary precaution for conserving the health of bathers is taken and if the bill becomes law it is reasonable to believe that all who enjoy swimming or bathing in public pools may enjoy the sport in safety.

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Horse Flesh for Food.—Following the provisions of the New York City Sanitary Code legalizing the sale of horse meat under a permit granted by the Board of Health and subject to the board's regulations, the first market for the sale of horse meat in that city was opened during the last of January. In order to prevent deception, no other meat can be sold in such establishments, and every precaution is taken to safeguard the consumer, the horses being slaughtered under the supervision of the veterinarians of the health department. In this connection there is reproduced in the *Weekly Bulletin* of the New York City Department of Health for February 17, a letter addressed to the Department of Health by Dr. W. Horace Hoskins, Dean of the New York State Veterinary College, commending this new venture. The letter is as follows:

"I am much interested and quite approve of the action of your department in permitting the opening of establishments for the sale of horse meat.

"So clean an animal, so free from tuberculosis and many other serious lesions common to our flesh-producing animals, and the continually soaring high prices of animal foods, makes it extremely desirable that opportunities be afforded to obtain cheaper meats.

"The long prejudice held by so many people against horse meat, I trust, will soon be eliminated."

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Blood Analyses in a State Health Laboratory.—In the current *Quarterly Bulletin* of the State Board of Health of Rhode Island there appears the following excellent editorial in support of increasing the scope of the State Health laboratories so that it will include this important field of analytical work:

"Although the present scope of our laboratories is comprehensive, there is still fresh opportunity for the application of newer methods in chemistry. Since recent literature indicates the value of uric acid, the nonprotein nitrogen, and the urea nitrogen content of the blood as indices of renal function, a system of practical tests should be adopted in order to estimate uric acid, creatin, sugar and the CO_2 combining power of the blood. These blood determinations give more accurate diagnostic and prognostic information than is afforded by urinalysis and their advantage lies in the fact that the physician does not have to pay attention to prepared diets and to specimens of urine carefully collected. Also, the relation of these facts to renal disease assumes importance in consequence of the mortality of the age groups beyond 25 and 30 years. It is an alarming fact that the death-rate for Bright's disease has increased from 95.2 to 103.1 per 100,000 in the interval between 1909 and 1912 in the registration area. It seems a duty and an obligation of the State Board of Health to pursue remedial investigations in this field also, and it feels justified in using the laboratories for this purpose.

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National Board of Medical Examiners.—The second examination to be given by the National Board of Medical Examiners will be held in Washington, D. C., June 13, 1917. The examination will last about one week.

The following states will recognize the certificate of the National Board: Colorado, Delaware, Idaho, Iowa, Kentucky, Maryland, North Carolina, New Hampshire, North Dakota and Pennsylvania. Favorable legislation is now pending in twelve of the remaining states.

A successful applicant may enter the Reserve Corps of either the army or navy without further professional examination, if their examination papers are satisfactory to a Board of Examiners of these services.

The certificate of the National Board will be accepted as qualification for admittance into the Graduate School of the University of Minnesota, including the Mayo Foundation.

Application blanks and further information may be obtained from the Secretary, Dr. J. S. Rodman, 2106 Walnut Street, Philadelphia.

Public Health Notes.

Commission on Milk Standards.—*Public Health Reports*, for February 16, publishes the Third Report of the Commission on Milk Standards appointed by the New York Milk Committee.

The preamble sets forth the essentials of proper milk standards for efficient milk control by public health authorities; shows the advantages of such standards to the milk producer, the milk dealer and the milk consumer, and emphasizes the necessity of satisfactory administrative equipment for properly guarding and enforcing them. It also advises the grading of milk.

A special committee, composed of chemists, advise that the chemical standards be 3.25 per cent. fat and 8.5 per cent. solids—not fat, for cow's milk. Sellers of milk are to be permitted to sell under these standards, or under a guaranteed statement of composition.

Bacteria and bacterial testing received more of the commission's time than any other subject. The standard methods of the American Public Health Association Laboratory Section have been adopted for making the bacterial count. It is recommended that, "at least five consecutive bacterial counts, taken over a period of not less than one week, nor more than one month, and that at least four out of five of these counts (80 per cent.) must fall below the limit or standard set for the grade," be made for the purpose of grading and for prosecutions. Various reasons showing the relationship of large numbers of bacteria to infant mortality are enumerated.

The commission defines pasteurization as follows: "That pasteurization of milk should be between the limits of 140° F. and 155° F. At 140° F. the minimum exposure should be 20 minutes. For every degree above 140° F. the time may be reduced by one minute. In no case should the exposure be for less than five minutes."

They recommend that all milk, excepting grade A raw milk, be pasteurized, preferably in the final container. A holding time of 30 minutes at a minimum temperature of 145° F. is advised in order to allow a margin of safety under commercial conditions.

As a guide to health officers in the establishment of grades of milk best adapted to their local communities, the following fundamental principles are offered:

"(*a*) Grade A milk, in a general way, is milk which complies with requirements of such character and degree that, for all practical purposes, no real advantage would be gained by further and higher requirements. The standards for this grade should therefore be placed high enough to attain this end, but not so high as to limit too greatly the supply, or, through unduly raising the price to the consumer, to limit too greatly the demand.

"(*b*) Grade B milk is all the remaining milk of the community which is suitable for drinking purposes, after pasteurization, but which does not comply with the high requirements for grade A milk.

"(*c*) Grade C milk is milk which falls below the minimum requirements for milk suitable for drinking purposes, even after pasteurization. Its use must be confined to cooking and manufacturing purposes. Recognition of this grade of milk is not recommended by this commission except in communities in which such recognition is an economic necessity.

"The fundamental objects in grading milk are:

"(*a*) To aid in making safe for human consumption all milk which can legally be sold for drinking purposes;

"(*b*) To distinguish between classes of milk which, while all are safe, are of different degrees of excellence in respect to cleanliness and care in handling."

The report states: "In the interest of public health, cream used in the manufacture of butter should be pasteurized before being used"; and also: "that all milk and cream used in the manufacture of ice cream be pasteurized."

It is urged that laws prohibiting the sale of skim milk as a food, be repealed.

Clarification is not recommended as a required standard method.

Two appendices are included in the report. The first deals with the factors of primary importance in dairy practice for controlling the sanitary character of milk; and gives a recommended form of score card for ice cream manufacturing plants. The second appendix relates to the history of the Commission on Milk Standards appointed by the New York Milk Committee.

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Hygiene of the Head Cavities.—"There is no more important field of preventive medicine than that of the hygiene of the head. The more one studies the modern man—civilized, cultured, pampered, served by scientifically harnessed natural forces almost as was Aladdin by the slaves of the lamp—the more evident it becomes that disease, old age and death fairly radiate from the cavities of the head."

So says Eugene Lyman Fisk, Director of Hygiene, Life Extension Institute, New York City, in an article entitled, "The Rôle of Mouth Infections and Mouth Abnormalities in the Causation of Disease."

"Season after season the mass of the population suffer from naso-pharyngeal affections involving acute bacterial attack and resultant strain of organic tissue."

In addition to the effects of these affections, Doctor Fisk further states: "We have to consider the effects of the establishment in the various head cavities of chronic foci of infection."

He believes: "That if the cavities in the head could be kept in a thoroughly healthy state, free from infection and their functions well maintained, at least four years could be added to the expectation of human life."

The head cavities are considered to be, "the region par excellence for the entry of infection, as well as for nutritive material and oxygen."

Excluding the brain, very few individuals enjoy absolutely normal and perfectly functionating head cavities.

Concerning orthodontics he says: "These tooth irregularities contribute very largely to mouth infection and hence to organic disease. It seems true that the modern mouth is degenerate in all its parts."

In conclusion: "The detection of these abnormalities . . . should be a systematic routine affair, applied to the whole population."

It is then urged that facilities be provided by which the benefits of this treatment may be extended to all who need it.

The article appears in the *Texas Medical Journal*, for January, 1917.

✤

Infantile Scurvy.—A. F. Hess, New York (*Journal A. M. A.*, Jan. 27, 1917), defends his opinion, formerly expressed, that infantile scurvy may be caused by the continual use of pasteurized milk. This is contrary to the opinion expressed by the National Commission on Milk Standards but he considers that it is still correct and offers additional facts. The practical deduction, however, from his observation is not that pasteurization should be discouraged but merely that the important fact should be recognized that milk treated in this way is not a complete food for infants, but that it is imperative to give an antiscorbutic substance in addition. When this prophylactic measure is adopted, pasteurized milk is to be recommended as a most valuable food for infants. When it is neglected, however, he thinks that scurvy brought on in this way is not at all infrequent. He points out the differences of scurvy produced by pasteurized milk from those of the florid disease. "The affected baby is usually in the second half of the first year of life, and does not gain, or gains but slightly for weeks. It may be fairly well nourished, but is pale, with perhaps slight edema of the eyelids. The mother or nurse complains that the child is irritable and peevish, and that the appetite has diminished. The gums may show merely a lividity or slight peridental hemorrhage, which on subsequent examination is no longer visible, and may have consisted merely of a rim of crimson edging the borders of the upper gum, or perhaps have been situated behind the upper incisor, as Still pointed out. On closer examination it may be observed that the papillae of the tip of the tongue are markedly congested, and that a petechial spot is to be seen on its frenum, on the palpebral conjunctiva, or here and there on the surface of the body, more especially where there are erosions, eczema or other skin lesions. Attention may be called to tenderness of the lower thighs, which in some instances is definite, in others so ill defined and fleeting that it is impossible to feel convinced of its significance or even reality. There may be a slight edema over the crests of the tibia, of the kind which does not pit on pressure. The knee jerks are almost always markedly exaggerated. The urine is found to be normal or to contain some albumin and red and white blood cells." These symptoms are subject to manifold variations and there are others worthy of note, especially the changes in the skeleton shown by the Roentgen ray, and those of the heart. Hess specially calls attention to the cardiorespiratory phenomena, in which the respiration goes as high as 60, and the pulse beats to 140 or 150. There is a sharp drop in the pulse and respiration after giving orange juice, which is evidence of its scorbutic nature. An increase in respiration is a polypnea rather than a dyspnea, and the slight disturbance it seems to make in the child has probably caused its being overlooked. There is one more link in the evidence that the nervous system is involved which has been shown by his former observation of changes in the eye-ground and the reflexes. The disease occurs generally in infants from six to nine months of age who have been fed for considerable time on heated milk. Another type found occasioned by pasteurized milk is the latent form of scurvy, a state of malnutrition which develops slowly as a result of a negative balance of "vitamins." It is rarely definitely diagnosed except by the relief of symptoms by antiscorbutics.

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Public Health and Private Conscience.—We wish to call the attention of our readers to a little booklet under the above title which was recently received. This booklet was prepared by the Instructive District Nursing Association of Boston, Mass., and has been written with the idea of bringing the work of this association before the public in a more popular way than annual reports can hope to do. In it are briefly though interestingly discussed the importance of health and the expense of ill health, and an historical sketch of the development of the public health nursing movement in Boston from 1885 to the present day. In general the association of today has set itself four main tasks: "To provide competent bedside nursing for those unable to pay for it; to provide such service at cost for people of limited means; to inculcate the elementary principles of hygiene and sanitation which make for a better and healthier community, to educate the public to an appreciation of the fact that public health is, or should be, a public responsibility." The booklet goes further on to state the manifold duties of the public health nurse and the several excellent illustrations it contains well emphasize the importance and nature of their work. As is the case with most of the welfare organizations, this Association has recognized its main function as that of clearing the trail for more organized, better financed, work to follow, and one of its chief services has been to demonstrate the need of public health work, later to be taken over by the municipal and state authorities.

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The Rat.—Some time ago we had occasion to comment in the pages of the JOURNAL upon the activities of the Women's Municipal League of Boston in combating the rat menace in that city. Recently this same league has issued a most excellent bulletin entitled "The Rat" which sets forth arguments for its elimination and methods for its destruction. This bulletin, or better monograph, was written by Assistant Surgeon General R. H. Creel, of the United States Public Health Service, especially for use by this League in its present rat campaign. Doctor Creel first dispels the widespread belief that an animal parasite, no matter how obnoxious, has compensating features. After conservatively estimating the rodent population of the United States as one rat per person, the author describes the species, the habits, and the destructiveness of the American rats. In discussing rats as disease transmitters the statement is made that of all disease-bearing parasites the rat stands supreme in the cost its presence has entailed upon mankind in toll of lives and money. In view of this statement it can scarcely be wondered at that the women of this city are effectively waging their campaign against this parasite. The monograph ends with considerable discussion of the methods of destruction of the rat and prevention from this menace. Concerning the prevention it seems that rat proofing is the only means by which it is possible to materially reduce the rodent population.

This bulletin is a splendid example of the benefits which can be derived from the union of women to control or to improve the general sanitation of a community. The power of an organization of women can be, indeed, enormous and it is to be hoped that the consideration and benefits derived from the publication of this bulletin will be deserving of the efforts which prompted its preparation.

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Where Memory Is Golden.—The earnest labors of a certain class of workers engaged in the business of "skinning the public" have been liberally and forcefully recognized by the medical press, and more recently by a considerable number of state and local health publications. None, however, compel our admiration to a greater extent than the gifted editor of the Ohio *Public Health Journal*.

It seems that the following letter from a seven-year old appeared in an advertisement published in the *Ohio State Journal:*

"I took the whooping-cough when I was only two months old. It settled on my lungs and I gradually declined until it was necessary to carry me on a pillow. They took me to the doctor and tried every one they thought would help me, but got little relief from my cough. After taking a bottle of your medicine, I found that I was improving very much. I have taken Nacor until my cough is almost gone. I am now seven years old, weigh 46 pounds and go to school every day. I give Nacor all the praise for my relief and hope that I can only cause some one else to try it."

Our editor is moved by the inexcusable negligence of the Nacor people in not calling their wonderful discovery to the attention of educators, correspondence schools of memory training, or even to physicians with difficult cases of amnesia. "Such a wonderful specific as this may even lead to the re-casting of one of our old favorite songs," he exclaims, and grasping his lyre, sings us the following:

"How dear to my heart are the scenes of my childhood
When a stiff drink of Nacor transports me with joy,
E'en back to the point of my very beginning,
As I hear the Doc saying: 'Fine work! it's a boy.'
The excitement, the yelling, the relatives telling
The good neighbor women who rush in to see.
Oh give me the bottle, the only draught what'll
Bring all them dear scenes again clearly to me.

"So up from my earliest days I remember,
Thanks to the sweet potion which rolls back the years,
My colic and whooping-cough, measles, distemper,
My joys and my sorrows, my smiles and my tears.
But I keep regretting and cannot help fretting
And constantly stop reminiscing to mourn
That at two months no faker had dosed me with Nacor
So my mem'ry'd go back to *before* I was born."

✱

The Cigarette and the Heart of the Soldier.—It was a foregone conclusion that the conditions of the present war would bring into prominence various forms of heart affections. Of course, organic disease would disqualify a man from serving in the army, but there can be little doubt that in the circumstances of this war and especially during the later phases many with heart defects of a more or less serious character have been passed in, who in the ordinary course of events would have been at once rejected. However, it is not so much with the cases of organic disease that the discussions which have been taking place among the medical men of the warring European nations have been concerned, but rather with those cases which apparently have been developed by the stress of warfare. Sir James Mackenzie and several British physicians debated in the pages of the prominent English medical journals, the condition known as the irritable heart of soldiers and came to no definite conclusions. Undoubtedly, however, the nervous strain under which soldiers live had much to do with the development of the irritable heart as well as of other forms of heart affection. It was by some suggested that cigarette smoking, which habit is prevalent among a very large proportion of soldiers, might be a factor in the production of the irritable heart.

Dr. E. Kilbourne Tullidge writing in the *Military Surgeon*, January, 1917, on the heart of the recruit and soldier, basing his remarks on his experience in the Austrian army, points out that in most of the cases of irritable heart, the symptoms developed suddenly, following some physical strain or stress of the campaign. In a number, chiefly younger men, the disturbance could be traced directly to the excessive use of tobacco, resulting in increased blood pressure and concomitant signs of a developing insufficiency. This, Tullidge thinks, is a strong indication, and an important one, that tobacco, notably cigarettes, should be restricted among the troops on active service. He believes that its use fulfills a much needed and sought after solace, but there is no question that it is carried to excess, with results that must necessarily weaken and lower the physical and systemic resistance of the men. Tullidge states that excessive smoking was universal among the soldiers with whom he came into contact and that as a result not only were nervous phenomena of the heart observed, but catarrhal conditions of the mouth, throat, and pharynx occurred, with gastrointestinal symptoms of every description. In the main he seems to agree with Mackenzie as to the nonpathological significance of the irritable heart of soldiers, but the point in his paper to which attention is especially drawn is that tobacco smoking, especially cigarette smoking, is largely responsible for these nervous cardiovascular disturbances.—*Medical Record*, February 10.

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Fifteen Thousand Mothers Die in the United States.—More women 15 to 45 years of age die in the United States from conditions incident to maternity than from any other cause except tuberculosis. And since 1900, while the death-rates from tuberculosis, typhoid, diphtheria and croup, and certain other preventable diseases have been greatly reduced, the available figures for the death registration area show no decrease in the proportion of mothers whose lives are sacrificed yearly to ignorance and improper care in childbirth.

These facts and their causes, with a detailed study of maternal death-rates in the United States and foreign countries, are set forth in a bulletin on Maternal Mortality by Dr. Grace L. Meigs, which has just been issued by the Children's Bureau of the United States Department of Labor.

Doctor Meigs emphasizes the inseparable connection between the life and health of the mother and the life and health of her baby. She points out that the 15,000 maternal deaths which occur annually in the United States are largely preventable; that these 15,000 deaths are merely a rough index of unmeasured preventable illness among mothers; and that the protection of mothers is essential to the saving of babies' lives.

How can the protection of mothers be accomplished?

Two underlying causes are assigned for the present conditions:

First. The hazards have been either ignored or accepted as unavoidable. "Knowledge of the need for good care at childbirth is essential; the lack of such knowledge and of a demand for this care has been, probably, the chief factor in producing the present indifference to this phase of preventive medicine. Communities are still to a great extent indifferent to or ignorant of the number of lives of women lost yearly from childbirth."

"The second fundamental cause—the difficulty of obtaining adequate care—is seen to depend to a large extent on the first. As women, their husbands, physicians, and communities realize the absolute need of skilled care, methods for providing it will be developed."

The city problem and the rural problem are both discussed.

Even in a city well supplied with clinics and hospitals the number of women served by them is small in comparison with the number who bear their children without receiving adequate care. Certain sections of the population depend on ignorant midwives. But the reader is reminded that women of moderate means who can not pay large fees and who will not visit a clinic sometimes receive the least benefit from improvements in standards of care.

"In rural districts many women bear their children with no attendant other than the husband, a relative, or a neighbor. The nearest physician may be miles away, the nearest hospital much farther."

Doctor Meigs refers to the work for maternal and child welfare which has been developed in New Zealand and in Canada, and suggests a "unit plan" for a rural county in this country to include:

A rural nursing service, centering at the county seat, with nurses especially trained to recognize dangerous symptoms in prospective mothers.

An accessible county center to which mothers could come for information about personal hygiene.

A cottage hospital, or beds in an accessible general hospital, especially for the proper care of abnormal cases.

Skilled attendance obtainable by each mother in the county.

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Hospitals for Small Towns.—*The Modern Hospital* for January, 1917, contains an editorial on the use of old buildings for hospital purposes.

It states that the time is coming when hospital facilities will be required for practically every case of sickness.

At present approximately 12 per cent. of the illness in this country coming under the physician's care is hospitalized and about 88 per cent. is cared for in the homes. This means that the number of hospital beds must grow amazingly to keep step with the education of the public to demand hospital care.

Approximately $300,000,000 is being expended annually in the United States for hospital buildings and almost an equal sum for the maintenance of hospitals.

Large, wealthy communities can take care of themselves but in rural districts and small towns hospital service must be afforded at a minimum cost. In many of these communities large, well built residences can be found with such interior arrangements that they could be transformed for hospital use for an extremely modest sum.

Fire protection is an important factor in considering such a building for hospital use, but with our modern methods we can go far toward eliminating fire risks in a one- or two-story dwelling house.

The article concludes by saying that one such hospital in a town is worth more to that community, if properly administered, than dozens of finer hospitals that must be reached by railroad travel of fifty or a hundred miles.

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Community Control of Tuberculosis.—Dr. Haven Emerson, commissioner of health of New York City, writing in the *Journal of the Outdoor Life* of January, 1917, says: "The community control of tuberculosis narrows down to the discovery of the carrier and the segregation of those who are unable to control their own home conditions in a way to prevent the spread of the disease. We must register many failures in both lines of action."

He further states that an annual physical examination for all people must be encouraged by educational methods and all possible means in order that all tuberculous patients may be discovered. Until such an examination at least once a year becomes a community habit the carriers cannot be detected.

The Health Department must filter out and segregate the ignorant, vicious or indifferent carriers and sufferers who are handicapped because of personal habits or home surroundings.

The control of the positive sputum cases comes first. They cannot safely be permitted to remain in any premises where there is insufficient light and poor ventilation.

The importance of alcohol as a predisposing factor in the causation of tuberculosis must be recognized by the community and every effort brought to bear on its suppression.

The successful result of community control of tuberculosis in certain parts of Australia is cited as an example of what community effort has done toward getting rid of this sanitary disgrace and heavy economic burden.

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The Geographical Distribution of Amebiasis.—That "tropical dysentery" of amoebic origin is a "surprisingly widespread infection" not only in the subtropical climates but also in the north temperate zone of the United States is the conclusion drawn by Dr. A. W. Sanford in an article on the Geographic Distribution of Amebiasis (*Journal of the A. M. A.* Dec. 23, 1916). He found that in the past five years among 5,000 patients examined for parasites, 819 from Canada and the Northern States showed some form of amoeba in their stools—535 showing Entamoeba histolytica, and 284 Entamoeba coli. It was also true that of these 819, the great majority were natives of the states in which they resided, and consequently became infected there. Thus of 5,000 northern patients examined at the clinic in question, 18 per cent. showed amoebiasis of some sort; furthermore the number having stool examinations was less than 5 per cent. of the total number of patients registered at the clinic during the five years in question.

We reproduce below by the courtesy of the *Journal of the American Medical Association* a map showing the geographical distribution of the patients examined at this clinic, showing amoebiasis. It will be noticed that the district around the locality of the clinic (the Mayo Clinic of Rochester, Minn.) appears to show a relative great preponderance of the infection, but this false impression is dispelled when it is considered that 30 per cent. of the registration at the clinic is of patients from Minnesota, and 20 per cent. of patients from Iowa.

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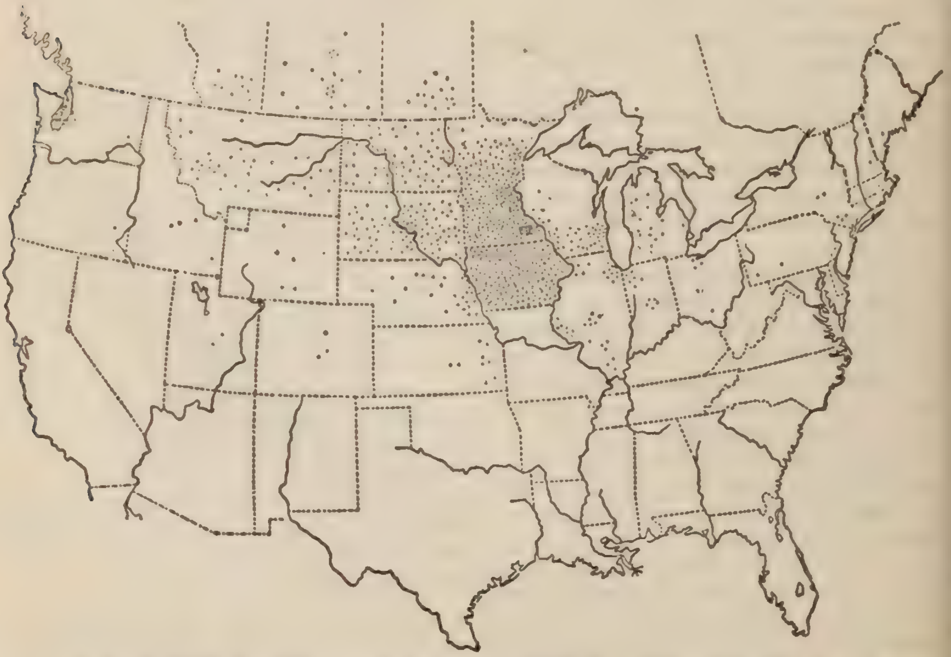
Two New Periodicals.—We desire to call to our readers' attention the publication of two new journals in the field of public health and medicine, each of which is admirable testimony of the unceasing development of this great field of endeavor.

Mental Hygiene is published quarterly by the National Committee for Mental Hygiene, Inc., 50 Union Square, New York City. In the Foreword in the January number the aim of this publication is given as follows:

"*Mental Hygiene* will aim to present non-technical articles and reports by recognized authorities. It will republish from time to time noteworthy contributions to our knowledge of mental disorders which would otherwise be out of



Patients developing amebiasis in Northern United States and Canada examined at the Mayo Clinic, 1911-1916: O, Endamoeba histolytica; +, Endamoeba coli.

reach of the general public. It will review important books and it will serve as a medium for the first publication of the results of original investigations undertaken in this field. It is our hope that *Mental Hygiene* will prove equally useful to the highly trained worker in psychiatry or psychology, the physician engaged in preventive medicine, the teacher seeing in education preparation for life, the magistrate concerned not only with the consequences but the causes of the offence before him, the parent seeking knowledge of the mechanisms by which character is built, and the student of social problems desirous of understanding the complex fabric of organized society through knowledge of those factors which mould the mental lives of individual men and women."

The *Journal of Urology* of which Dr. Hugh H. Young, of Johns Hopkins, is editor, published bimonthly by Williams and Wilkins Company, 2419–21, Greenmount Ave., Baltimore, is the other valuable addition to the medical field.

The *Journal of Urology* will be planned along broad lines. As the varied problems of the urinary tract are open from every aspect for discussion, papers from the medical, surgical, chemical and experimental viewpoint will be published. The experimental work discussed will include the chemistry and biochemistry, physics, embryology, anatomy, physiology, pharmacology, bacteriology and pathology of the urinary tract and also of the many organs and functions with which it is so closely related, as for example in nephritis. It will be the policy of the *Journal* to encourage and stimulate original contributions in its domain. Interesting papers of a historical nature will also be presented. The *Journal of Urology* will thus not only serve to record the advances in urological science, both medical and surgical, but it will also serve as an instrument for constantly maintaining and furthering the correlation between this and all the other branches of medicine.

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Shellfish Industry.—H. S. Cumming, Washington, D. C. (*Journal American Medical Association*, December 30, 1916), remarks on the importance and the great expansion of the shellfish industry in the United States during the last few decades and the evils that have accompanied it, as well as other evils due to changes in the sanitary conditions owing to modern methods and extension of sewerage disposal. Owing to the activity of the health authorities and the powers granted to the Public Health Service, some of these evils have been remedied and the more obvious dangerous localities abandoned, but, owing to the difficulties of control and inefficiency of state and local organizations, the efforts have been only partially successful. Congress in 1912 passed an act enlarging the work of the Public Health Service, and among other things provided for the study of the pollution of navigable waters. The writer has been director of the study of coastal waters under the Public Health Service, and to properly carry out the investigations a steamer was fitted for laboratory purposes in addition to laboratories on shore. An experimental laboratory with large tanks was established on Fisherman's Island at the entrance to Chesapeake Bay for the purpose of solving problems relative to the pollution of shellfish. Many important facts have already been ascertained, and aid has been given by the different state authorities and from large oyster planters and dealers. The bureau of chemistry has taken up the study of shucking-house and shipping conditions. It was found that shellfish were being shipped from some polluted areas, some of them dangerous. State and federal authorities have been notified, and the former have usually been prompt to take such corrective steps as were afforded by existing laws. At present the great bulk of oysters shipped around the country are from safe grounds, and shucked oysters are opened in fairly sanitary houses, but unfortunately there are still some defects in oysters being taken from a few polluted localities and shucked under insanitary conditions. There is no good reason at the present time as to the purification of oysters grown in moderately polluted waters being rendered safe by transplantation for a sufficient length of time to unpolluted waters, if the state authorities will do their duty, and health authorities should supervise the sanitation of shucking conditions. The determination of the safeness and unsafeness of shellfish areas cannot be left to local or state authorities alone, as they lack, as a rule, the facilities, nor have they always the entire confidence of other states. As most of the shellfish are consumed in communities away from the source, the problem is properly one for federal investigation in coöperation with the states. Local and state authorities can assist by a careful study of the origin of typhoid fever cases, the collection of data relative thereto, and the reporting of such cases to the Public Health Service. The control of sanitary conditions of shellfish is an important problem, which especially requires the hearty, thorough coöperation of local, state and federal authorities. Without such control, the danger of occasional outbreaks and of isolated cases from infected shellfish will continue, and the industry will decline, while the population will be deprived of a nutritious and delicious food.

Industrial Hygiene and Sanitation.

Munitions and Health.—A great deal has been written lately on the health hazards connected with the munition industry. Great efforts are being made in Great Britain and in this country to combat the *danger from explosives—industry poisons*. Dr. W. G. Hudson of the Du Pont de Nemours Company, discusses the subject in a detailed manner in the *Medical Record* of January 20, 1917. The effects of nitroglycerin upon workmen are popularly known as "powder headaches" and "powder knockout." Physiologically the effect is due to the transformation into nitrite after absorption. Nitroglycerin is surprisingly readily absorbed by the skin. Even shaking hands with a workman or examining the chest of one of them, is sometimes sufficient to cause headache in one not immune to it. A tolerance is soon developed. There are no chronic effects. Nitric acid in the form of "mixed acid" may cause burns by actual contact. By far the largest percentage of serious accidents follow the inhalation of fumes arising from nitric or mixed acid (mixture of nitric and sulphuric acids). The deleterious action of the nitrous fumes upon the human system is entirely due to their local corrosive action. The fumes set up a pulmonary edema; they may set up a lobar pneumonia. Various measures, such as the use of oxygen helmets, may be employed to eliminate the poisonous effect. The nitro-aromatics, to which nitrobenzol and trinitrotoluol belong, exert their toxic action chiefly upon the blood. The toxic effect may result in acute and chronic symptoms. The vapors are far more poisonous than the solid compounds. Among the prophylactic measures are scrupulous cleanliness and efficient ventilation. Frequent diagnostic blood examinations afford another valuable measure. A certain degree of tolerance may be acquired. Aniline compounds act similarly to the nitro-aromatics with the exception that they are not likely to produce a leucocytosis. The symptoms are well known. Cyanosis is marked. A large number of compounds are strong local irritants. There is also danger from the fumes given off in the manufacture of fulminate of mercury.

In Great Britain the matter of T. N. T. (trinitro-toluol) poisoning has become so important that the medical inspector of factories has prepared for the benefit of practitioners a paper on the subject. A short account of the circular may be found in the *Journal of the American Medical Association* of February 10, 1917.

A very exhaustive study of the subject has been made by Dr. Alice Hamilton in an article entitled "Industrial Poisons Used in the Making of Explosives." The article, which is contained in the February issue of the *Monthly Review of the U. S. Bureau of Labor Statistics*, represents a preliminary report of an investigation of forty munition plants in the United States. A full description of the plants together with a consideration of methods of prevention and treatment of the poisoning incident to work in these factories will appear later.

We also desire to call our readers' attention to the article on Munition-Plant Poisons by Mr. Archie Rice, which is appearing in this issue of the JOURNAL on page 273.

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Coal-Mine Fatalities in the United States, 1916.—Compiled by Albert H. Fay. The returns received by the Bureau of Mines, Department of the Interior, from the State Mine

Inspectors show that 1916 is a banner year in the low record of coal mine fatalities in the United States. The decrease is about 3 per cent. as compared with 1915, while the production of coal increased about 12 per cent. The number of fatalities reported during the year was 2,225 as compared with 2,269 for 1915. Figures are not yet available showing the actual number of men employed during the year, but on the basis of the number of men employed in 1915 the fatality rate was 3.03 in 1916 as compared with 3.09 per 1,000 men employed in 1915. This is the lowest rate since 1898, when about one-half the number of men were employed.

According to the Geological Survey the estimated production of coal for 1916 was 597,000,000 tons as compared with 531,619,487 tons in 1915, so that the number of tons of coal mined per fatality in 1916 was 269,000 as compared with 234,297 in 1915, and 209,261 in 1914. The production per fatality in 1916 is therefore the greatest in the history of coal mining in the United States.

During 1916, there were 11 mine disasters in each of which 5 or more men were killed, being the same number as in each 1915 and 1914. The number of men killed by these disasters in 1916 was 154, the lowest since 1901, as compared with 262 in 1915, 316 in 1914, and 464 in 1913. The principal net decreases in fatalities for the year are as follows: Falls of roof and coal, 14; gas and dust explosions, 78; explosives 9, surface accidents of all kinds, 12. While in the above causes there was a gratifying decrease shown by reason of the educational work conducted with reference to the study of gas and dust explosions, and the introduction of permissible explosives, there was a net increase of 43 fatalities due to mine cars and locomotives underground, and an increase of 8 in various shaft accidents. As haulage systems necessarily increase in scope as the mines become larger, there should be a concentrated effort on the part of all to reduce the hazards connected with this feature of the mining industry.

Although the net decrease is not large, yet it shows that the efforts exerted by the various agencies whose object is to reduce mine accidents are meeting with success. Among the means employed to reduce accidents may be mentioned the general use of safety lamps in doubtful mines, the introduction of permissible explosives, humidifying dusty mines, first-aid and rescue training which save lives that might otherwise be lost by reason of injuries received, the enactment of industrial accident compensation laws, and the spirit of coöperation on the part of all concerned.

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Employment during Adolescence in Massachusetts.—If Dr. M. Victor Safford, in his study of male minors working in the cotton mills of Massachusetts, had done nothing else than to point out the need for central authority in the issuance of working certificates, he would have performed a distinct service to the community, but in this study issued by the United States Public Health Service as Bulletin No. 78, "Influence of Occupation on Health During Adolescence," Dr. Safford has shown clearly the value of painstaking work properly directed and carried out in an investigation of this sort. The Bulletin reviews intelligently the Massachusetts laws as they affect the working of minors and gives a brief but comprehensive description of the conditions under which minors work in cotton mills, and the character and kind of work they are called upon to perform.

Doctor Safford finds that the work at which the boys are employed in cotton mills would appear to involve but slight hazards in the way of industrial accidents, and that danger of chemical poisoning can apparently be excluded. The report is accompanied by classified tables of physical development and by standard tables of heights and weights, for purposes of comparison. Doctor Safford puts his finger directly on two most important factors in health conservation when, at the close of his recommendations, he points out that the schools of Massachusetts offer an opportunity to educate parents indirectly in child welfare, and that medical supervision of school children contemplated in existing statutory law of the commonwealth offers the means of preventing directly many of the diseases and defects among young workers.

We wish that it might be given to Doctor Safford to study in detail and to report upon a plan for an organization which would not only "contemplate" but which would actually carry out to the best advantage the real meaning of the Massachusetts laws concerning the medical supervision of school children, and the teaching of hygiene in the schools. If Doctor Safford's recommendations concerning the issuance of employment certificates were enacted into law (and there is no good reason why they should not be); if school hygiene were given the place its importance deserves, and if medical supervision of school children in Massachusetts were really medical supervision in all the term implies, the industries of Massachusetts and the commonwealth would be far better off because of the enforcement of such legislation.

We recommend the careful perusal of Public Health Bulletin No. 78 to all who are interested in the health of young persons.

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Industrial Pensions in Sweden.—Regulations for the inauguration of the largest private pension project in the history of Sweden were promulgated, November 19, 1916, at a meeting of the superior board of managers of Swedish industrial associations and various chambers of commerce. (*Commerce Reports*, January, 2, 1917.) Men pay 10 per cent. of their salaries for their own pensions and 6 per cent. for family pensions. Men are eligible to full pensions at 62. Women are entitled to full pension at 57, provided they reach their highest compensation before 38. Membership is compulsory for all employees of concerns who belong to above organization.

⁂

An Interesting Decision.—(Larke *vs.* John Hancock Mut. Life Ins. Co.). The Supreme Court of Errors of Connecticut affirmed a judgment sustaining an award under the workmen's compensation act in favor of the claimant whose husband had been in the employ of the company soliciting insurance and collecting insurance premiums. Unusual exposure of the man to cold produced lesions of the face and erysipelas set in as a consequence. The man died. The court concluded that the "frostbite" was a personal injury, "arising in the course of and out of his employment." It was held to be immaterial that erysipelas does not ordinarily result from frostbite.

⁂

The Medical Provisions of the Young Bill in Massachusetts.—Governor McCall of Massachusetts devoted an extensive section of his annual message to Health Insurance, recommending definitely the establishment of a compulsory system of health insurance. Representative Young introduced a bill, which can be studied in detail in the Boston *Medical and Surgical Journal* of February 1, 1917. The Young bill supersedes, of course, entirely the Doten bills discussed in this section on numerous occasions. The general system of medical organization for the care of the sick under the Young bill is the "panel of physicians." Every physician licensed to practice under the laws of Massachusetts may enter the panel of his district by registering with the State Commission. Freedom of choice of physicians by patients is guaranteed. Medical attendance to dependent members of the families of insured persons is included. The Young bill does not limit the panel physician to 1,000 insured persons. The Commission, in the recommendation of the Medical Advisory Board, has the power to lay down the maximum number of patients to be allowed a panel physician. The payment is upon a visitation basis. The State Commission is to consist of five members and is the supreme administrative authority, The Medical Advisory Board consists of eleven members. Provision is made in the Young bill for medical officers who are to pass upon the certificates of disability to work. Provisions for preventive medicine in the bill is made to a greater extent than in any preceding proposal.

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The Illinois Industrial Board has completed the settlement of fourteen of the eighteen death claims against the Elgin National Watch Company as a result of a recent typhoid epidemic. The epidemic was due to contaminated drinking water furnished employees. The case is of particular importance because it tends to establish the principle that under certain conditions typhoid fever is an occupational disease.

⁂

Medical Care of Employees.—C. H. Lemon, Milwaukee, Wis. (*Journal A. M. A.*, Jan. 13, 1917), describes the general conditions in industries, especially in the care of employees and their general physical condition, and describes the favorable results obtained by the Milwaukee Electric Railway and Light Co., and its organization of the Employees Mutual Benefit Association. He says he has been surprised at the results obtained by insisting under all conditions on the continuance of the preëmployment medical examination of employees, even when candidates were few and at a premium. He says the more difficult it becomes to obtain employment the more desirable that employment will become, and ignoring this fact and letting up on conditions is likely to do damage to the employing company. The details of his article as to the experience of the Milwaukee company are of interest, and the results of the organization of the Employees Mutual Benefit Association are given. They have a savings and loan association, additional life insurance, sick and accident insurance, a provident loan fund, where money can be had without interest, old age pensions, a woman's auxiliary, etc., and all the auxiliaries that go to provide healthful recreation and promote happiness. Once a year, divided into two days of recreation, 12,000 people including employees, their wives and families, have a picnic with a 20-mile trolley ride. They have found that in a large corporation it is possible to have a feeling of intimate relationship, and the medical man, perhaps above all others, comes close to bringing about happy conditions.

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According to an opinion given by the Wisconsin Industrial Commission the largest reduction in accidents has been accomplished in establishments in which rank-and-file workmen acted as inspectors. One to three men are appointed in each large department to serve one or two months. The inspection takes place once every week or once every month. These inspectors are in a very good position to interest their fellow workmen and induce them to do their part.—*Factory*, February, 1917.

✱

Effect of the Minimum Wage in Retail Stores in Massachusetts.—The minimum wage decree covering female employees in retail stores became effective on January 14, 1916. According to its provisions no female employee of ordinary ability aged 18 or over, having at least one year's experience, should be paid less than $8.50 a week. Inexperienced girls under 17 should not receive less than $5.00. The decree was very strongly opposed in newspapers and at public hearings. Early in February, 1916, the Minimum Wage Commission investigated the workings of the decree. Of the 16,036 women employed as full-time workers in all the establishments inspected, 93.8 per cent. were receiving not less than the recommended rates. Higher-priced workers did not seem to be affected. The effect of the decree upon women employees seems wholly good. It is possible, however, that it may lead to a reduction of the number employed, the poorer workers being the ones to suffer. There was no evidence to show that extras were being substituted for regular full-time workers.

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Behind the Scenes in a Restaurant—A Study of Women Restaurant Employees.—The Consumers' League of New York City has recently undertaken a study of conditions in restaurant work, in which between 15,000 and 20,000 women are employed in New York State. Details of the investigation are available in a special bulletin of the League. The investigation covered a group of 1,017 women and girls in the state. More than two-thirds are foreign born; almost one-third were married; one-fourth were under twenty-one years old. Very objectionable features of the work are the long hours and the nerve-racking character of the work. Only 42 per cent. of the women worked less than 55 hours a week, one-fifth worked over 75 hours, and 5 per cent. over 85 hours weekly. Six women worked over 105 hours weekly.(!) There is no provision for any rest during the day. Wages are about on the same level of those in unskilled industries for women. One-fourth of the group were paid less than $5 a week. Eighty-nine per cent. received less than $9, which has been fixed as the minimum on which a girl can live properly in New York. Even when due allowance is made for tips and meals, thirty-one per cent. received less than $9. To meet this situation regulations are sadly needed.

✱

The National Safety Council of Chicago has a committee of safety experts working out the maximum and minimum requirement in safeguardings. The findings of these experts are contained in the monthly "Safe Practices" leaflets, three of which have already been issued. They pertain to "Ladders"; "Stairs and Stairways"; and "Border Rooms." It is difficult to see how a modern industrial establishment can afford to overlook the excellent suggestions in the illustrated leaflets. Membership in the Council entitles the holder to additional valuable service. Five bulletins a week are issued to educate workmen and managers. The address of the Council is 208 South La Salle Street, Chicago, Illinois.

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The Wellington Act.—The amended form of the Child Labor Law, known as the Wellington Act, which went into effect in New York on February 1, provides that no employment certificates shall be issued unless the applicant has reached the age of 15 years and has completed grade 6B or its equivalent, except that a child who has been graduated from a public school may receive an employment certificate at 14 years. No changes are made in the law in the requirements regarding physical fitness. In its present form the law seems to meet the necessities of the situation in admirable fashion, and its enforcement may be expected to result in great benefit.

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In honor of Dr. Charles McIntire, former Secretary of the American Academy of Medicine, the Academy has offered two prizes to be awarded at the annual meetings in 1918 and 1921 respectively. The subject for the 1918 prize is "The Principles Governing the Physician's Confirmation in the Various Forms of Social Insurance," that for the latter prize, "What Effect has Child Labor on the Growth of the Body?" All essays must be in the hands of the secretary of the Academy on or before January 1 of the year in which the prize is to be awarded. Further details may be obtained from the Secretary, Dr. Thomas W. Grayson, 1101 Westinghouse Bldg., Pittsburgh, Pa.

*

Laundries and the Public Health.—M. C. Schroeder and S. G. Southerland of the New York City Health Department carried on a very instructive study of "Laundries and the Public Health," the results of which are published: Public Health Reports U. S. P. H. Service, Vol. 32, No. 6. The purpose of the study was to ascertain the methods employed in New York City in laundering clothes, with special reference to the efficacy of such methods in destroying pathogenic bacteria and thus preventing the spread of disease. The investigators found that the sanitary conditions existing in the average "hand laundry" managed by white persons are of a very low grade, falling far below those existing in Chinese laundries. The state factory laws concerning living quarters are violated in both Chinese and hand laundries. The use of the "blow can" for dampening clothes is universal in Chinese laundries and may lead to infection. The methods employed in the average "hand laundry" of marking and sorting the clothes are unsuitable and a possible source of danger to the health of the employees and community. The primitive drying facilities employed are not such as would secure the death of all pathogenic germs which may have survived the washing process. The report also criticizes conditions found in the steam laundries. The method at present commonly employed by certain steam laundries of returning "wet" clothes to the patrons and to hand laundries is a possible menace to public health.

*

Quarry Fatalities on the Decrease.—In spite of the fact that the total number of men reported employed at quarries increased from 87,936 in 1914 to 100,740 in 1915 the number of fatalities dropped from 180 to 148 in 1915. Very detailed statistics on "Quarry Accidents in the United States During the Calendar Year 1915" appear in Technical Paper 165 U. S. Department of Interior, Bureau of Mines. The material is compiled by Albert H. Fay.

Personal Notes.

At the annual meeting of the Federation of the Medical Boards of the United States held recently in Chicago, Dr. Walter L. Bierring of Des Moines, Iowa, was elected secretary-treasurer.

*

Dr. Edward G. Whipple has resigned as medical director of the Rochester Public Health Association.

*

Dr. Waldon E. Munz has been appointed assistant bacteriologist of the city of Rochester, N. Y., succeeding Dr. W. L. Culpepper.

*

Mr. F. M. Harris has been appointed city chemist of Butte, Mont., succeeding Dr. C. E. Easton.

*

At the annual meeting of the Massachusetts Association of Boards of Health held recently in Boston, the following officers were elected: President, Dr. F. X. Mahoney; vice-presidents, Dr. J. S. Hitchcock and Mr. W. J. Kirshbaum; secretary, Dr. F. H. Slack; treasurer, Dr. F. G. Curtis.

*

Dr. John S. Billings, who will retire as deputy health commissioner of New York City on May 1 after twenty years' active service, will continue his work in preventive medicine in the capacity of health officer of the stock exchange and of the public library.

*

Dr. J. H. Pryor has been elected president of the Buffalo Association for the Relief and Control of Tuberculosis.

*

Dr. J. D. Case has been reappointed state health inspector of the Nebraska State Board of Health, and Dr. W. F. Wild has been reappointed state bacteriologist.

*

Dr. John G. Smith, of Frankfort, has been reëlected for the fourth consecutive term president of the Kentucky State Board of Health.

*

Dr. W. H. Robin has been reëlected secretary of the New Orleans Board of Health; Dr. Paul Gilpin, inspector of communicable diseases; and Dr. A. L. Metz, bacteriologist.

At the recent annual elections of the Louisiana State Board of Health, Dr. Oscar Dowling was reëlected president of the Board; additional appointments were made: Dr. J. M. Mosley as vice-president of the Board; Dr. M. W. Swords, secretary; Dr. John H. Ellis was appointed registrar of vital statistics; Dr. H. B. White was retained as medical advisor to the Board, and Miss Agnes Morris was appointed instructor in school hygiene.

*

Dr. E. T. Briver of Boise has been elected secretary of the Idaho State Board of Health.

*

Dr. Mortimer W. Raynor has been appointed by the Commissioner of Correction of New York City as Chief-physician-psychiatrist in the penal institutes of that city. The position is only recently created, and the duties include mental examinations of all committed prisoners.

*

Dr. B. C. Crowell, professor of pathology and bacteriology at the University of the Philippines, has been appointed director of the Graduate School of Tropical Medicine and Public Health of that University. This school gives courses which in one year lead to a degree of Doctor of Tropical Medicine, and in two years to Doctor of Public Health.

*

Mr. Edward R. Embree, formerly assistant secretary of Yale University, has been appointed secretary of the Rockefeller Foundation to succeed Jerome D. Greene.

*

At the ninth annual meeting of the National Committee for Mental Hygiene, held February 7, in New York, it was announced that during the past year over $30,000 had been contributed for general expenses by four donors, one of whom had also pledged $100,000 toward an endowment fund. The Rockefeller Foundation had contributed $34,000 for special purposes such as surveys of conditions among the insane and feeble-minded. These surveys have been completed in California, Colorado, Connecticut, Georgia, Louisiana, Pennsylvania, South Carolina, Tennessee, Texas and Wisconsin, and are now in progress in Chicago and New York. Sixteen state societies for mental hygiene have been organized. The initial issue of the quarterly organ, the *Journal of Mental Hygiene*, appeared in January. The following officers were elected: president, Dr. Lewellys F. Barker, Baltimore; vice-presidents, Prof. Charles W. Eliot, Boston, and Dr. William H. Welch, Baltimore; treasurer, Mr. Otto T. Bannard; medical director, Dr. Thomas W. Salmon, New York; associate medical director, Dr. Frankwood E. Williams, Boston, and secretary, Mr. Clifford W. Beers.—*Exchange.*

*

A new form of welfare work will be instituted by the General Electric Company at its Schenectady plant. Its object is to supervise education, employment and provision of opportunities for advancement of employees. This industrial service department is under the management of Mr. E. B. Merriam.

*

Surgeon Joseph W. Schereschewsky, U. S. P. H. S., has been investigating health conditions of steel workers in Pittsburgh to provide the government with information for minimum standards of industrial hygiene.

The following persons were elected for membership in the American Public Health Association, February 7, 1917:

Lawrence P. Geer, B. S., Berlin, N. H., Health Officer.

M. Gorman Prince, Hobart, N. Y., Bacteriologist.

Edw. R. Perry, M. D., Raymond, Wash., Health Officer.

Sherwood J. Larnard, Chicago, Ill., Asst. Gen. Mgr., Chicago Telephone Co.

Mr. Wm. A. Hadfield, Madison, Wis., Bacteriological Chemist.

Claude P. Fryer, M. D., New Orleans, La., Candidate for degree of D. P. H.

Wm. S. Sadler, M. D., Chicago, Ill., Physician and Surgeon.

J. Walter Ramsdell, Detroit, Mich., Director the Hygienic Lab., Ford Motor Co.

H. R. Lee, M. S., Decatur, Ill., Chemist.

Miss Winifred Stuart Gibbs, New York City, Lecturer in Household Arts, Teachers College, Columbia University.

Eugene C. Howe, Wellesley, Mass., Dept. of Hygiene, Wellesley College.

Alfred J. Mahnken, C. E., Weehawken, N. J., Civil Engineer, New York.

Current Public Health Literature.

Albany Medical Annals.

XXXVIII. February.

The Problem of the Social Adjustment of the Unusual Child. F. H. Knight.
The Backward Child—What Can Be Done for Him. J. T. Krause.
A New Field of Research—Alcohol. T. D. Crothers.
The Medical Administration of Health Insurance. E. A. Stapleton.

American City, New York.

XVI. February.

Some Problems of the Water-works Executive. G. O. House.
City Planning and Political Areas. G. E. Hooker.
Motion Pictures and Local Responsibility. Cranston Brenton.
The Comfort Station as a Public Utility. J. J. Cosgrove.

American Food Journal, Chicago.

12. February.

Food Standards—A Symposium.
Food Manufacture and the Law. T. E. Lannen and T. J. Hickley.
The Manufacture of Butter and Margarine. By the Editor.
Laboratory Control of Edible Fats. H. V. Cadwell.
Fats and Their Economical Use in the Home. A. D. Holmes and H. L. Lang.
Pasteurization. Adolph Gehrmann.

American Journal of Nursing, Baltimore.

XVII. February.

What Social Insurance Will Mean to Nurses. Martha M. Russell.
Civil Service Examination for Nurses. Jane E. Hitchcock.
Relation of the Nurse to Mouth Hygiene. J. W. Beach.

Boston Medical and Surgical Journal.

CLXXVI. February 1.

A Laboratory Aid in the Diagnosis of Scarlet Fever. D. M. Lewis.

February 8.

Possibilities in Social Service for Psychopathic Patients. Mary S. Jarrett.
Inebriety from a Medical Standpoint. I. H. Neff.
The Framingham Health and Tuberculosis Demonstration. D. B. Armstrong.
The Drug Treatment of Morphinism. F. H. Carlisle.

February 15.

Chronic Carbon Monoxide Inhalation and Some of Its Untoward Results. W. J. McGurn.
The Epidemiology of Anterior Poliomyelitis Epidemica, 1916. D. M. Lewis.
Medical Services and Hospital Fees under Workmen's Compensation. F. D. Donoghue.
Physical Examination and Medical Supervision of Factory Employees. W. I. Clark.
The Fallacious Social Philosophy of Health Insurance. F. F. Dresser.

Factory, New York.

XVIII. February.

Keeping in Touch with John and Jim. How Sixty-three Factory Managers Retain Contact with Their Men. Wm. Cordes.
Putting a Milk Man on the Payroll.
Knowing What Accidents Cost. R. W. E. Sizer.
Proof That It Pays to Ventilate. C.-E. A. Winslow.

Industrial Management, New York.

LII. February.

Hiring the Worker. R. W. Kelly.
Labor after the War. L. R. Freeman.

Journal of the American Medical Association, Chicago.

LXVIII. January 27.

Health Insurance and the Medical Profession. A. Lambert.
Observations on Immunity of Monkeys to Experimental Poliomyelitis. E. C. Rosenow, E. B. Towne, G. W. Wheeler.

February 3.

Results of Research on Conditions Affecting Posture. H. L. Taylor.
Conceptions and Misconceptions in Psychoanalysis. T. Burrow.
Group Study: A Report of 150 Cases. W. W. Behlow.
Treatment of Gonorrheal Infections by the Intravenous Injection of Killed Gonococci, Meningococci and Colon Bacilli. H. Culver.

February 10.

The After-Care of Poliomyelitis as a Public Problem. R. W. Lovett.
Bacterial Findings and Their Relation to Pyorrhea Alveolaris and Interstitial Gingivitis. A. W. Lescohier.
Physicochemistry of the Gonococcus in Relation to Immunity and Therapeusis. C. C. Warden.

Journal of the Florida Medical Association, St. Augustine.

III. January.

The Practical Policy. Oscar Dowling.
The Practicing Physician's Responsibility in Public Health Work. C. P. Knight.
Some of the Recent Ideas on Infantile Paralysis. J. H. Fellows.

Journal of Infectious Diseases, Chicago.

20. February.

Virulence of Diphtheria Bacilli from Diphtheria Patients and Diphtheria Carriers. G. H. Weaver.
The Alleged Detoxicating Power of the Thyroid Gland. H. R. Basinger.
An Epidemic of Acute Diarrhea Approaching in some Cases a Mild Dysentery. W. Sadler and R. F. Kelso.
The Passive Transference of Non-Specific Antibodies. P. K. Olitsky and D. S. Dinzer.
Comparative Study of Bacillus Anthracis-symptomatici and Allied Organisms with Respect to Gas Production. L. C. Todd.
Transmission of Pneumonic and Septicemic Plague among Marmots. F. Emerson and Wu Lien Teh.
Plague Poisons and Virulence. F. Emerson.
Effect of Various Chemical Substances on the Haemolytic Reaction. N. P. Sherwood.
Blood-culture Studies on Typhus Exanthematicus in Serbia, Bulgaria, and Russia. G. Baehe and H. Plotz.
Leukopenia and Leucocytosis in Rabbits. C. W. Wells.

Journal of Laboratory and Clinical Medicine, St. Louis.

III. January.

Application of Typhoidin Test in a Group of Nurses and Physicians. F. P. Gay.
Study of the Occurrence of Immature Polynuclear Leucocytes in the Circulating Blood in Pulmonary Tuberculosis and Other Infectious Diseases. A. M. Burgess.
A Simple Method of Plotting Charts. J. R. Williams.
Macrophages in Feces in Acute Dysentery. K. M. Lynch.
A Further Study of the Pathological Effects of Atmospheres Rich in Oxygen. H. T. Karsner and J. E. Ash.
Demonstration of Treponema Pallidum in the Cerebral Cortex of a Congenital Syphilitic Child. C. E. Keily.
A Machine for Shaking Blood Mixing Pipettes. G. G. Little.
Further Notes on a Modification of the Nogouchi Test. N. E. Williamson.

February.

Apparatus for Use in Examining Feces for Evidences of Parasitism. M. C. Hall.
Complement Fixation in Tuberculosis. G. B. Webb.
The So-Called Much-Weiss Tubercle Granules. G. B. Webb.

Journal of Outdoor Life, New York.

XIV. February.

House Infection and the Spread of Tuberculosis. S. H. Stone.
Results of Twelve Months of Field Work in County Tuberculosis Surveys in Michigan. Arnold Mulder.
The Patent Medicine Evil. P. K. Brown.

Journal of the National Dental Association, Huntington, Ind.

IV. February.

Oral Hygiene and Its Relation to Public and Individual Health. O. W. King.
Prophylaxis for Pyorrhea. P. R. Stillman.

Journal of the South Carolina Medical Association, Greenville.

XIII. January.

Necessity of Graphic Illustration of Sanitary Conditions in a Community. M. R. Mobley.
The Need and How to Obtain a Hospital in Every County in South Carolina. L. H. Jennings.

Medical Record, New York.

91. January 27.

Paratyphoid as Observed during an Epidemic in the 14th N. Y. Infantry while on U. S. Service at the Mexican Border. C. W. Berry.
A Study of Mental Retardation in Relation to Etiology. B. T. Baldwin.
Modified Method in Tuberculin Therapy. W. Meyer.

February 3.

Modern Diagnosis and Treatment of Syphilis. F. W. Smith.
Bacteriological and Experimental Researches on the Etiology of Sprue. H. Dold.

February 10.

Tuberculin Actions and Reactions. P. H. Ringer.
Effective Localization of the Streptococci from the Autotherapeutic Point of View. C. H. Duncan.

February 17.

Psychiatry and Psychology. C. L. Dana.
Birth Control: What Shall Be the Attitude of the Medical Profession toward the Present Day Propaganda. G. W. Kosmak.

Medical Times, New York.

XLV. February.

Feeble-mindedness and the Law from a Medical Viewpoint. T. W. Salmon.
Pediatric Review with Infant Feeding as Practiced During the Last Twenty Years. Louis Fischer.

Mental Hygiene, New York

I. January.

The Wider Field of Work of the National Committee for Mental Hygiene. L. F. Barker.
Underlying Concepts in Mental Hygiene. W. A. White.
Unemployment and Personality. H. M. Alder.
The Insane in a County Poor Farm. T. W. Salmon.
The Growth of Provision for the Feeble-minded in the United States. W. E. Fernald.
Mental Adaptation. F. L. Wells.
Organized Work in Mental Hygiene. C. W. Biers.
What Hospitals for Mental Diseases Can Do in Mental Hygiene. W. L. Russell.
The Sub-Normal Child—A Study of the Children in a Baltimore School District. C. MacFie Campbell.

Modern Hospital, St. Louis.

VIII. February.

Work of the Detroit Receiving Hospital. J. Dretzka.
Hospital Survey of a Community. J. J. Weber.
Small Community Hospital That Meets a Need. S. A. Lutgen.
Sociological Aspect of the Treatment of Alcoholism. C. B. Towns.
Emergency Hospitals for Industrial Plants. L. L. Watters.
The Small Community Hospital—The Organization. J. A. Hornsby.

Municipal Engineering, New York.

LII. February.

Brick Sewers. J. F. Springer.
Collection and Incineration of Garbage in Sewickley, Pa. E. E. Duff.
Alcohol from Garbage.

Municipal Journal, New York.

XLII. February 8.

How Sewage Plants are Operated.
Test for Chlorine in Water. F. E. Daniels.

February 15.

Wappingers Falls Water Supply. H. W. Taylor.
Water Supply of Parkersburg.

National Municipal Review, Philadelphia.

VI. January.

Municipal Preparedness. C. R. Woodruff.
Some Advance Municipal Steps. Lawson Purdy.
Evolution of Types of City Government in the United States. H. L. McBain.
Public Regulation of Wages, Hours, and Conditions of Labor of the Employees of Public Service Corporations. D. F. Wilcox.
Municipal Recreation—A Review of Recent Literature. G. A. Bellamy.
How Not to Plan Cities. J. H. McFarland.

New York Medical Journal.

CV. January 27.

Influenza *vs.* Tuberculosis. B. Frankel.
Mercurialized Serum and Bichloride of Mercury. P. S. Pittenger.
Supplementary Dietary Relationships among our Natural Food Stuffs. E. V. McCollum.
Consideration of Some Matters Relating to Diet. C. Bartlett.

February 10.

The Rights of the Unborn Child. B. C. Hirst.
The Vicious Circle in Oral Sepsis. N. B. Potter.
Birth Control. E. C. Podvin.

February 17.

Male Impotence and Sterility in Marriage. B. S. Talmey.
Don'ts in the After-care and Treatment of Infantile Paralysis. C. Ogilvy.
Research in Epilepsy. H. A. Knox.

New York State Journal of Medicine.

17. February.

Effect of Malformation and Infection of the Oral Cavity of the Child Upon Its Future Health. S. Palmer.
Economic Disadvantages of Compulsory Health Insurance. N. G. Curtis.
Comment on Arguments of Mr. W. G. Curtis. S. J. Kopetzky.
Need for Health Insurance. Irving Fisher.
Industrial versus Private Medical Practice. G. L. Howe.

New Orleans Medical and Surgical Journal.

69. February.

Epidemic of Dengue in Porto Rico, 1915. W. W. King.

Public Health Journal, Toronto.

VIII. January.

Principles Involved in Notification of Tuberculosis. P. H. Bryce.
Sanitation of Railway Cars. T. R. Crowder.
Causation of Dental Decay. Florence Withrow.
War and the Incidence of Insanity. Wm. Graham.

Safety Engineering, New York.

XXXIII. January.

Sight-Saving in the Industries.
Logging Accidents in Wisconsin.
Evidence as to Alcohol. N. C. Harte.
Training Pupils in the Spirit of "Safety-First." C. F. Pepper.
Suction System for Grinding Rooms.
Safety Standards for Cranes.

Social Service Review, Washington, D. C.

IV. January.

Who Demands the Production of Vulgar Salacious Scenes in Motion Pictures?
A New Slogan for Motion Picture Patrons. Your Problem and Mine; What Shall We Do to Combat the Growing Evil of the Immoral Motion Picture Drama?
Where Does the Responsibility Lie? Mary G. Peck.
Helping the Employee to Grow. E. Piper.
Our Responsibility to the Boy Who Works. F. H. Rindge.

Southern Hospital Record, Atlanta.

3. January.

Pellagra. Vena M. Woods.
How Public Health Nurses Can Aid a State Department of Health to Extend Its Program of Health Conservation. R. G. Patterson.

Southern Medical Journal, Birmingham.

X. February.

The Relation of the Medical Profession to Medical Preparedness. R. E. Noble.
A Simplified Technique in the Application of Schick's Reaction for Testing Immunity to Diphtheria. Wm. Litterer.
Report of the Committee on Uniformity in the Wassermann Reaction.
The Evolution Underway in Public Health Activities. J. A. Ferrell.
Importance of the Control of Childhood Infection in the Crusade for the Eradication of Tuberculosis. C. L. Minor.
Trachoma. John McMullen

Survey, New York

XXXVII. January 27.

Involuntary Servitude and the Right to Strike. J. A. Fitch.
Turning off the Spigot III. What Grandfather and Father Thought about Drink. Elizabeth Tilton.

February 3.

In Lincoln's Home. How the Springfield Survey Went About Getting Results. S. M. Harrison.
To Mothers Who Must Be Educated. Alice B. Munroe.
Prostitutes and Tuberculosis. Alice Hamilton.
Do Wages Buy Health? Mary D. Hopkins.
The Children's Bit in the War. W. D. Lane.

February 17.

Twenty-five Years of the Boston South End House. G. Hodges.
Cotton Pickers in the Northern Cities. Helen B. Pendleton.

United States Naval Medical Bulletin, Washington, D. C.

XI. January.

The Prevention of Venereal Diseases at the Naval Training Station, Norfolk, Va. C. E. Riggs.
The Complement Fixation Reaction on Board Ship. W. W. Cress.
The Syphilis Record. C. F. Cottle.
Hookworm Infection in Cuba. R. Spear.
A Preliminary Report on the Pathology of Narcotic Addiction. C. F. Stokes.

United States Public Health Reports, Washington, D. C.

32. January 26.

Control of Pollution of Streams—The International Joint Commission and the Pollution of Boundary Waters. Earl B. Phelps.

February 2.

Typhus Fever—Measures for the Prevention of Its Introduction at El Paso, Tex.
Interstate Sanitary Regulations. W. C. Rucker.

February 9.

Laundries and the Public Health—A Sanitary Study, Including Bacteriological Tests. M. C. Schroeder and S. G. Southerland.

February 16.

Commission on Milk Standards—Third Report of the Commission on Milk Standards Appointed by the New York Milk Committee.

BRITISH.

Journal of State Medicine, London,

XXV. January.

The Harben Lectures. Lecture III. By Alex. C. Houston. Physical and Bacteriological Changes Occurring in River Water under Conditions of Storage; Treatment of Algal-Affected Waters; Taste of Algal-Affected Waters; Thames-derived Filtered Waters; Water and Disease.
The Requirements of the Meningococcus in Culture. A. H. Drew.

Lancet, London.

CXCII. January 6.

Conditions Which Govern the Growth of Bacillus of "Gas Gangrene" in Artificial Media and in the Body Fluids *in vitro*, and in the Dead and Living Organism. A. E. Wright.
History of Six Cases of Amoeba Histolytica Carriers Treated with Emetine Bismuthous Iodide. C. G. Imbiere.
Surface Tension and the Wassermann Reaction. V. B. Nesfield.

January 13.

The Mechanism of Serum Reaction. H. R. Dean.
The State Octopus and the Medical Profession. Edmund Cautley.
Cases of Cerebro Spinal Fever in the Royal Navy. H. D. Rolleston.

January 27.

An Analysis of Recent Cases of Tetanus in the British Expeditionary Force with Special Reference to Their Treatment with Antitoxin. W. B. Leishman and A. B. Smallman.
Modified Tetanus. H. Burrows.
Weil's Disease (Spirochaetosis Ictero-haemorrhagica) in the British Army in Flanders. A. Stokes, J. A. Ryle, W. H. Tytler.
Toxic Jaundice in Munition Workers. M. J. Stewart.

Medical Officer, London.

XV. January 20.

The Increasing Disregard of Vaccination. Mathew Hay.
Quality Grades for Milk Supplies. J. F. Anderson.

January 27.

Restriction of Milk Delivery.
Supervision of Tuberculosis Contacts. G. B. Charnock

BOOKS AND REPORTS RECEIVED.

Poverty and Its Vicious Circles. *By Jamieson B. Hurry, M. D. J. & A. Churchill. London; P. Blakiston's Son & Co., Philadelphia. 1917. Pp. 167. Price, 5/, $2.00 net.*

Microbiology. *Edited by Charles E. Marshall. 2nd Edition. P. Blakiston's Son & Co. 1917. Pp. 861. Cloth, $3.00 net.*

Clinical and Laboratory Technique. *By H. L. McNeil. C. V. Mosly Co., St. Louis. 1916. Pp. 84. Illus. Price, $1.00.*

Practical Uranalyses. *By B. G. R. Williams. C. V. Mosby Co. 1916. Pp. 139. Illus. Price $1.00 net.*

Health and Disease—Their Determining Factors. *By Roger I. Lee, M. D. Little, Browne & Co., Boston. 1917. Pp. 257. $1.75 net.*

Annual Report of the Massachusetts Civic League for the year ending October 31, 1916.

Annual Report of the Oregon State Board of Health for year ending December 31, 1915.

The Public Health Committee of the New York Academy of Medicine—*A Survey of Its Activities during five years of work, 1911–1916.*

Report of the Philippine Health Service, January 1–December 31, 1915. *J. D. Long, M. D., Director of Health.*

Is Mosquito or Man the Winter Carrier of Malaria Organisms? *By M. Bruin Mitzmann. Public Health Bulletin No. 84, December 31, 1916.*

Convict Labor for Road Work. *By J. E. Pennybacker, H. S. Fairbanks, and Dr. W. F. Draper. Bulletin No. 414, U. S. Department of Agriculture.*

Report of the Milk Committee of the Oranges, July, 1914, to December 31, 1915.

California Pure Foods and Drugs Acts, Food Sanitation Acts, Cold Storage Act, with Rules and Regulations, 1916.

Quarry Accidents in the United States for 1915. *Technical paper 165. Department of the Interior, Bureau of Mines.*

Federal Responsibility in the Solution of the Habit-Forming Drug Problem. *By Charles B. Towns.*

Metal Mine Accidents in the United States during the Calendar Year of 1915. *Compiled by A. H. Fay. Technical paper 168. Department of the Interior.*

Separation and Identification of Food-coloring Substances. *By W. E. Mathewson, U. S. Department of Agriculture.*

Supreme Court of the United States. *October term, 1915. No. 235. The Hutchinson Ice Cream Co. et al.; plaintiffs in error vs. the State of Iowa. Brief on the History and the Present Meaning of the term Ice Cream. Compiled by C. G. Child.*

Fourth Annual Report of the Institute of Public Health of London, Canada, 1915–1916.

American Journal of Public Health
Official Monthly Publication of the American Public Health Association
Vol. VII APRIL, 1917 No. 4

DEATH-RATES IN OLD AND YOUNG STATES.

T. D. Tuttle, M. D.,
State Commissioner of Health of Washington, Seattle, Washington.

Read before the General Sessions of the American Public Health Association, Cincinnati, Ohio, October 27, 1916.

IN 1915 I was appointed State Commissioner of Health for the state of Washington. I found that this state showed a remarkably low death-rate of 8.0 per thousand population. I believed that such a death-rate could result only from a lack of complete registration of deaths. However, after checking the death returns in every conceivable manner, I was convinced that they were as complete in Washington as in most, if not in any, of the states in the registration area.

My opinion in this matter was confirmed by Dr. C. L. Wilbur, who in the spring of 1916 made a thorough investigation of the registration work in our state. Without his having so stated to me, I am firmly of the opinion that Doctor Wilbur did not find a single death in the state of Washington for which we could not produce a death certificate, with the possible exception of a few that had occurred on the federal reservations, over which we have no control.

It is then evident that the low death-rate in Washington, and this applies to most of the Rocky Mountain and Pacific Coast states, is not due to imperfect registration.

Having become thoroughly satisfied that the deaths in the state of Washington are being properly recorded, I found myself confronted with this question: "Has the state of Washington a death-rate of 8.0 per thousand population, or is it barely possible that the Federal Census Bureau is not quite infallible in the matter of estimating populations?" I, therefore, started a search for evidence as to the accuracy or inaccuracy of the estimated populations, and found that in the 1908 report of the Census Bureau, populations for the various states were given at certain figures, these figures being the result of estimates made from the 1890 and 1900 census counts, and from counts made by certain states at various intermediate periods. In the 1909 report of the Census Bureau, I found that the states were credited with entirely different populations, this latter set of figures being based on the 1900 and 1910 census count. I found that these figures varied in the two reports from as much as 513,241 in California, to as low as 1,104 in Vermont. The total population of the seventeen states in the registration area in 1908 is given at 38,384,382, as based on the 1910 census, whereas the estimate in 1908 was only 36,690,955, or a difference of 1,693,427. But this is not the entire variation, for some of the states were overestimated while others were underestimated, so that the actual variation was in reality 2,051,407. (See Table I.)

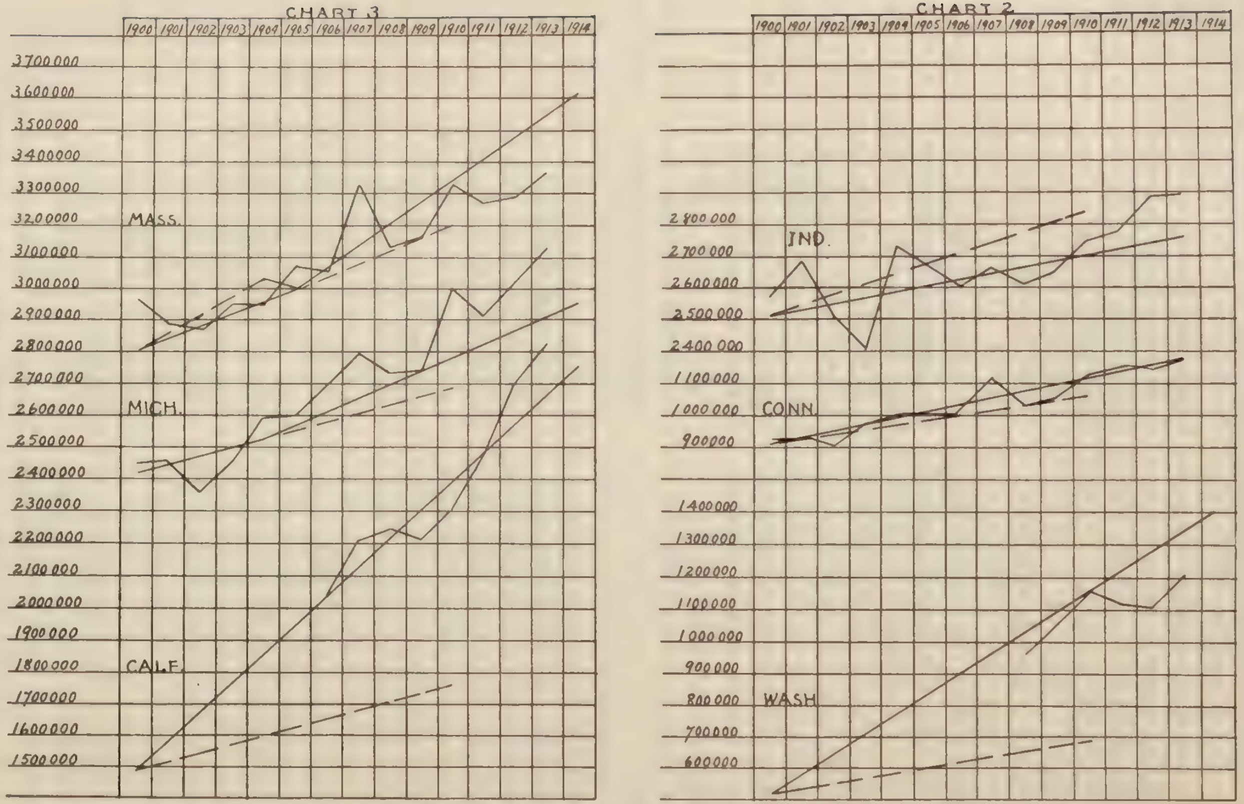
It is evident, then, that the estimated population is, by their own publications, admittedly inaccurate. While one might, in a charitable mood, admit that the estimate for the entire seventeen states as a whole is fairly accurate, one cannot possibly admit that the estimate for the individual states, with the possible exception of six, is fairly accurate as to the numbers, nor that it is a fair estimate upon which to base a death-rate for the individual states. But the whole story of the variations in populations is not told in these figures. In estimating the population for each year it is assumed that the growth was equal throughout the ten-year period. Now there is no more foundation for assuming a constant growth in the population of a state than there would be in assuming that the vertical growth of a boy would be the same each year for a period of ten years from eight to eighteen. "It simply isn't done." As a matter of fact, it is very probable that the population of the state of Washington was very nearly as great in 1908 or 1909 as it was in 1910, and that it increased comparatively little between 1900 and 1904 or 1905. In other words, the greatest proportion of growth from 1900 to 1910 occurred between 1904 and 1908 or 1909, and the population estimate based on the census of 1910 is at variance with the facts to just the extent that the growth varied in different years. It is, therefore, evident that the population of various states, as estimated by the Census Bureau is frequently far from correct and results in misleading death-rates.

I believe this sufficient evidence to prove that, while the estimated population as made by the Census Bureau may be a fair average for the entire country, it is not fair or just as it pertains to the individual states, and especially to the younger states, as a basis for estimating death-rates. The question naturally arises, "Is there a method by which the estimated population may be checked or by which an entirely new estimate may be made that would prove more equitable?" In considering this question it must be remembered that in many instances, if not in the large majority, the local and state registrars of births and deaths are also health officers. They are, therefore, in a position equi-distant between his Santanic Majesty and a deep pit of water of sapphire hue. That is, they are expected to exert every effort within their power to prevent disease and death, and, on the other hand, they are expected to return a sufficient number of deaths to satisfy the ideas of the Washington authorities as to what is proper. If by the neglect of one function they manage to satisfy Washington, they may become swamped by the sapphire wave from their home people. On the other hand, if they fail to satisfy Washington, they are inundated by the same wave because Washington throws them out of the registration area or fails to make an estimate of the death-rate, which has the same ultimate effect. Therefore, some method of estimating population should be worked out whereby the local health officer may be given credit for his work in preventing deaths, and, at the same time, credited with the death-rate to which his locality is entitled, be it high or low.

In confronting this question I undertook to see if there is an actual relation, year in and year out, between population and death returns, and if such relation exists can it be used in such a manner as to give credit to the work done in the matter of preventive medicine? With this idea in view I studied the death returns from many states and from many of the principal cities. At this stage of my investigation I found that should I include all the states and all the principal cities in the registration area, the result would be a very bulky affair. I, therefore, selected six states and six principal cities, as follows: Two each from the Atlantic Coast, namely, Connecticut and Massachusetts, and Boston and Richmond, Va.; two each from the Middle States, namely, Michigan and Indiana, and Detroit and Indianapolis; and two each from the Pacific Coast States, namely, Washington and California, and Seattle and Portland. Believing this a fair average of the entire registration area, I have used the figures for these states and cities throughout this report.

The question under consideration is, "Is there a constant relation between populations and deaths from non-preventable diseases?" I, therefore, deducted from the total number of deaths in each area the deaths from the following diseases: Typhoid, tuberculosis, measles, scarlet fever, whooping-cough, diphtheria, and enteritis in children under two years of age.

After deducting deaths from these preventable diseases from the total deaths in each locality, I estimated the death-rate from what I designate as "non-preventable" deaths. In making this estimate I used the population as given in the re-estimate of the Census Bureau in the vital statistics report for 1909, this being the more nearly accurate of the two sets of figures published. I then found the average death-rate from non-preventable diseases for the 10 years from 1900 to 1909, and with this average and the number of deaths from non-preventable diseases, estimated the population for the various years. The results of this study are set forth in Tables IV and V. They, together with the results set forth in Table I, are illustrated in Charts 2, 3, 4, and 5. In Charts 2 and 3 the six states used are represented. The broken line represents the population



Populations as Estimated by U. S. Census Bureau and by Death Returns.

Broken line represents estimated populations based on 1890 and 1900 Census. Solid straight line represents populations based on 1900 and 1910 Census. Irregular line represents populations based on Death Returns.

as estimated by the Census Bureau from 1900 forward, and the solid line represents the population estimated forward and backward from 1910. The broken line is extended from 1908 to 1910 simply to show where it would have ended had the estimate been continued. As a matter of fact, the Census Bureau discontinued its estimation along this line in 1908. Note the wide divergence between the solid lines and the broken lines in Washington and California. Note the curve in Massachusetts as a result of using the state census in 1905. Also in Michigan as a result of using the census from 1900 to 1904. Now follow the irregular line which represents the population as determined from deaths from non-preventable diseases. Note how closely it follows the reëstimate for Connecticut. How it indicates that the population of Michigan, California and Indiana is underestimated, and how the population of Massachusetts and Washington is overestimated from 1910 forward.

In 1910, with a known population, the state of Washington showed a death-rate of 10.0 per thousand. In this year 21.5 per cent. of all deaths were caused by preventable diseases (see Table IX). In 1913 only 17.1 per cent. of all deaths were caused by preventable diseases. Thus through sanitary efforts, we have reduced in 1913 our total number of deaths by 4.4 per cent.

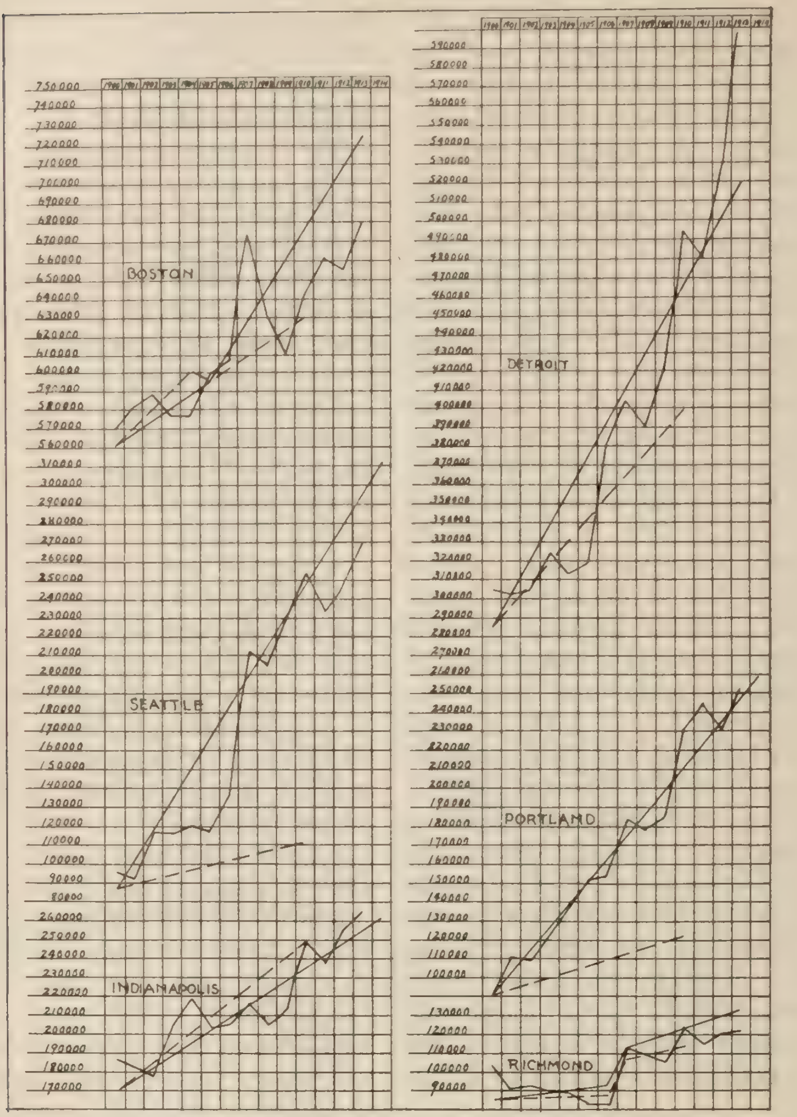
We recorded 11,397 deaths in 1913. This means that, had our death-rate for preventable diseases remained the same in 1913 as it was in 1910, we would have recorded 501 more deaths, or a total of 11,898. This would give us a death-rate, based on the Census Bureau's estimate of population, 8.8 for 1913, and thus accounts for 0.8 of the reduction in the death-rate between that of 1910 and that of 1913.

The balance of the reduction between these two years we can account for only on the assumption that the population is overestimated, and we therefore believe that the population as estimated from the death returns is more nearly accurate than that estimated by the Census Bureau.

Following the same method of procedure, we find that the death-rate in the state of Massachusetts is either 15.8 instead of 15.0 for 1913, or else their population is overestimated. If it is claimed that public health work influences the death-rate in diseases other than those classed as preventable, and in this way Massachusetts' death-rate is actually brought down to 15.0 per thousand, then the same credit must be given to Washington and her death-rate be accredited as 8.0 per thousand.

Note that in every district studied there is a marked rise in the irregular line in 1907. In submitting this study I do not profess to have carried it to its ultimate end. In order to make this method of estimating populations accurate and of value the vital statistics report must be gone into very thoroughly. However, a very casual study of the death records of 1907 shows that much of this rise was due to influenza. In any instance an unusually marked rise or fall in the num-

CHART 4.



Populations as Estimated by U. S. Census Bureau and by Death Returns.

Broken line represents estimated populations based on 1890 and 1900 Census. Solid straight line represents populations based on 1900 and 1910 Census. Irregular line represents populations based on Death Returns.

ber of deaths calls for a careful study of the causes of death during that year and for confidential coöperation with the state and local authorities in regard to causes for such rises or falls in the number of deaths.

Now let us consider Chart 4. Here we have the same matter represented for cities that we have considered for states. Note the identical conditions with regard to Boston as noted with regard to Massachusetts. Note the peculiar curve in estimated population lines for Richmond in 1907. Now note the sporadic growth in Seattle. The irregular line diverges downward from the reëstimated line in 1903 and 1904, then it turns upward and crosses the reëstimate line in 1907, here going above on account of the general high death-rate throughout the country in this year, falling slightly below 1908 and coming up again in 1909 and 1910. Now this appears sporadic and unnatural, but as a matter of fact, it is perfectly natural. Seattle did grow very rapidly from 1905 to 1909; since then the growth has not been so rapid. This is not a mere theory. The Census Bureau has, or could easily obtain, information supporting this statement.

I submit herewith a clipping from the *Post-Intelligencer* of February 28, 1916. (See Chart 5.) This is a chart intended for advertising purposes and hence cannot possibly be construed as giving Seattle any the worst of it. Note real estate transfers from 1905 to 1910. Note building permits line from 1905 to 1910, and how this line falls off in 1910. Note population line, said to be based on Polk's Directory, but if this line is a result of Polk's statistician, it certainly seems to me that this statistician must have roomed with, if he did not sleep with, the statistician that estimates the population for the U. S. Census Bureau. Their findings are too closely related for even the idea of brotherhood to account for their mutual likeness.

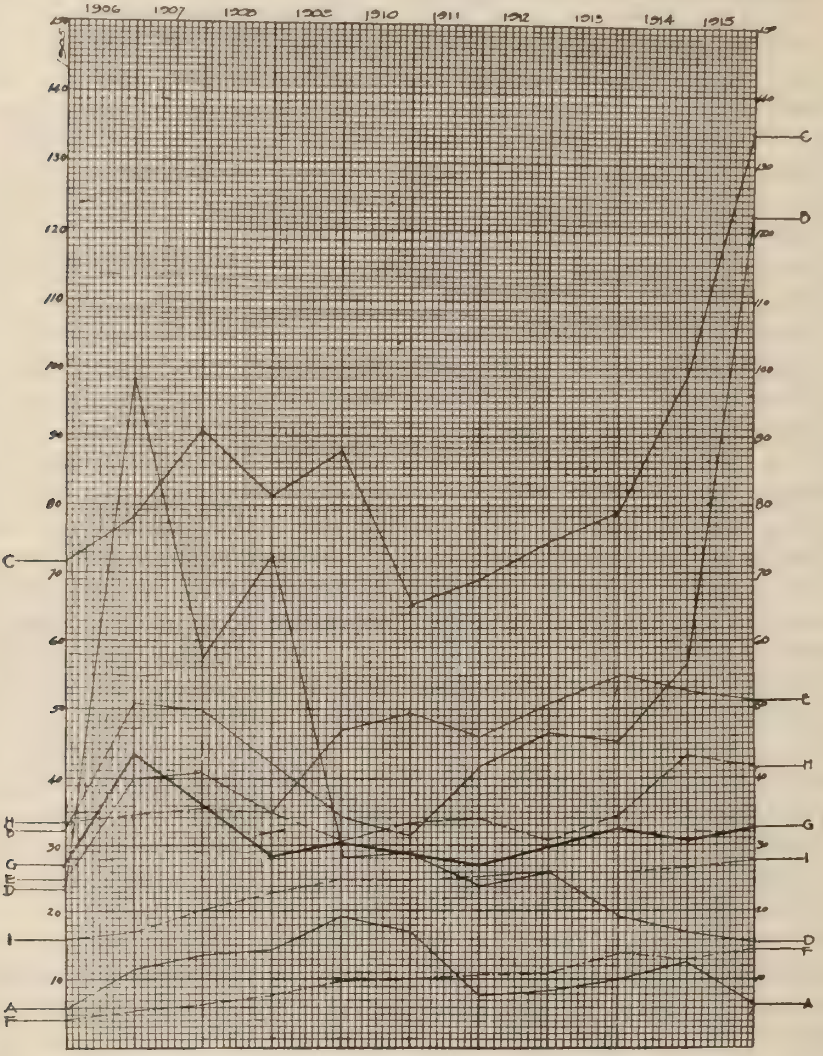
While I realize that the decimal point system now followed by the Census Bureau in estimating population is most simple, I hold that this method is grossly inaccurate. While it may be used as a general basis of estimate, nevertheless, when the irregular line indicating population based on death returns materially diverges from the solid black line, the bureau should consider the question of where the error lies. If after studying the causes of deaths in a locality, the business conditions that may tend to bring new population in or to draw population away, and if after taking the matter up with the local authorities as to any unusual causes of deaths, it is found that the population is probably under or overestimated, then make an estimate based on actual facts as they exist in the year under consideration and not as they existed eight or ten years prior thereto.

Following the irregular line indicating populations based on death returns in the state of Washington and in the city of Seattle, it must be remembered that with improved conditions in the lumber business and general return of prosperity, it is entirely possible that this line may swing

CHART 5.

SEATTLE BUSINESS CHART

1905 to 1915, Inclusive



Compiled by The Long Building Company, Architects and Builders, Seattle.

KEY

A—Building permits	Seattle	each small square	$1,000,000
B—Foreign commerce (water)	Seattle	each small square	1,000,000
C—Domestic commerce (water)	Seattle	each small square	1,000,000
D—Real estate transfers	King County	each small square	1,000,000
E—Bank clearings, monthly average	Seattle	each small square	1,000,000
F—Postoffice receipts	Seattle	each small square	100,000
G—General per capita average of above	Seattle	each small square	100
H—Total tax levy	Seattle	each small square	one mill
I—Population, based on Polk's directory, using multiple for 1900 and 1910 federal census	Seattle	each small square	10,000

NOTE—To secure annual totals add small squares, beginning at bottom of chart at right marginal line for year desired.

upward—undoubtedly will swing upward—and may reach and even pass the solid black line at or before the next census period, and thus apparently prove the estimate of the Census Bureau correct; but the proof will be only apparent and not actual. I have not presented the figures from Montana but I am absolutely satisfied that the population of Montana is proportionately as grossly underestimated today as that of Washington is overestimated. Note the rapid rise in death-rates in Montana during the last five years. This is an unhealthy rise, it is unnatural, it is, in short, simply absurd.

Recognizing the inaccuracies in estimated populations, the next question is, "What influence have such inaccuracies in the death-rates on the various states?" Table I–a is simply a copy of the death-rates as given in various vital statistics reports, the six cities being selected to illustrate this point. Inspection of this table shows that the death-rate, as estimated prior to the 1910 census, varies from that estimated after this census to as great a degree as 5.5 per thousand population. In the reports for 1906, 1907 and 1908, no statement is given regarding the population of the city of Seattle. However, in the 1906 report we find a death-rate for Seattle of 12.7, and in 1907 report a death-rate for Seattle is given as 15.7. On looking the matter up I found that had the same rate of increase in population been allowed for each of these years, as had been allowed for the years 1900 to 1905, that the death-rates would have been respectively 14.5 and 19.0, and the rate for 1908 would have been still higher. I, therefore, wrote the Census Bureau and asked that I be given the figures showing what their estimate of population of Seattle was for 1906 and 1907. I received a reply but not the information requested. Naturally, knowing the number of deaths and death-rate allowed, one can easily figure the population assumed but how and by what method this particular number was arrived at is a question that baffles me. Regardless of how this particular irregularity was worked out, the actual published figures show a variation of 5.5 per thousand in the death-rates for Portland, on account of having found that the estimated population in 1908 was inaccurate.

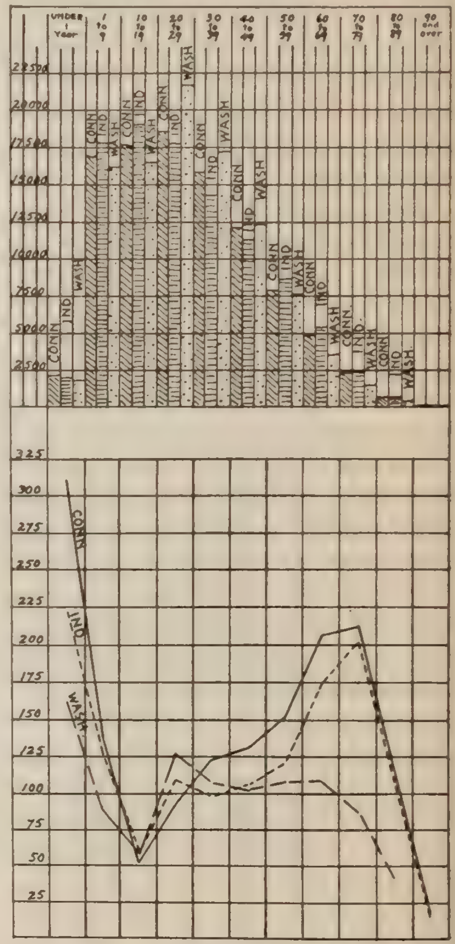
As the same methods of estimating populations are used today as have been used heretofore, are we not perfectly justified in assuming that the estimated population of the various states is as inaccurate today as in 1906, and that some states or cities are being credited with nearly four per thousand higher or lower death-rates than they are entitled to receive?

Recognizing the fact that with the lowest possible estimate of population, the state of Washington still shows a remarkably low death-rate, I undertook to determine in what ages the deaths took place. I therefore estimated the death-rates per 100,000 population for certain ages. These death rates are based on total population and not on population of a specific age. The population used in this estimate is the population as given in the vital statistics reports, these being "corrected" to bring them up to certain months. All deaths in unknown ages are eliminated from consideration, as I did not feel inclined to guess where they probably belonged. The result of this study is set forth in Table II.

Finding that the death-rate for the state of Washington reached and even exceeded that of the other states studied in certain ages, I questioned "Is there a relation between the age distribution and this death-rate?" I, therefore, estimated the population in each age period per 100,000 total population. In this and in all subsequent studies where the age question is involved, the population used is that as given by the Census Bureau report for 1910, without any correction whatever to bring them up to any particular month; and in every instance populations and deaths of unknown ages are eliminated from consideration.

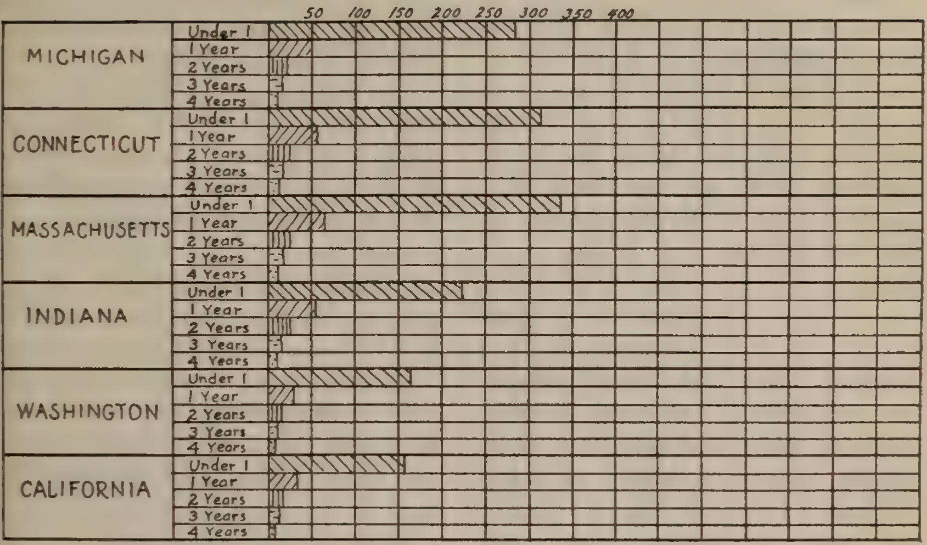
In this latter study I confined myself to three states and the result is set forth in Table III. These figures being of especial interest to me, I attempted to bring them out through means of tracings, as represented in Chart 1. It seems to me evident that Washington is getting her death returns in certain ages as completely as is Connecticut or Indiana. This being the case, it does not seem reasonable to assume that she is selecting certain ages on which she insists that all deaths be recorded and neglects to insist that deaths be recorded in other ages. In other words, it does not seem reasonable to assume that an undertaker would take a chance at burying a body 60 years of age or 5 years of age, without having procured a proper permit and having filed a certificate of death, and, at the same time, be very careful to file the death certificate for the body of a person 20 years of age. I do not maintain that this is sufficient evidence to prove that Washington is receiving com-

CHART I.

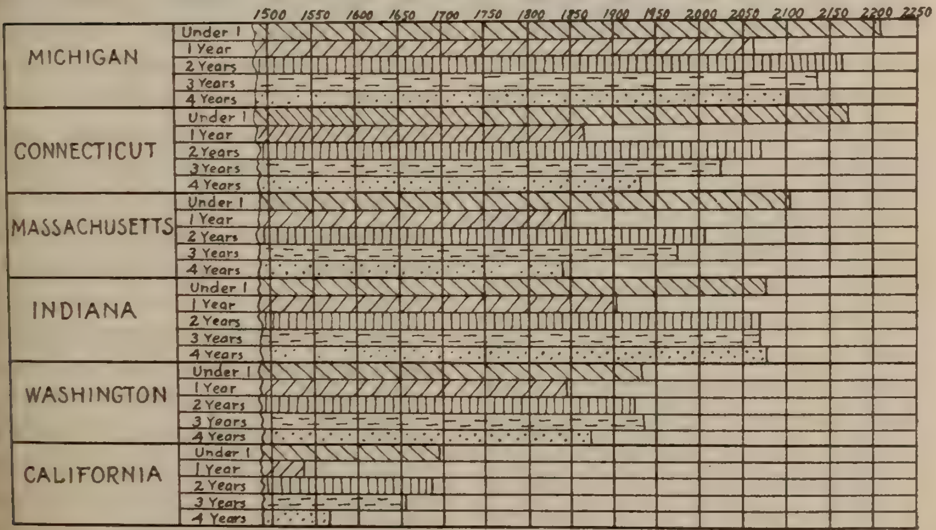


Populations and Deaths by Ages Per 100,000 Total Population.

CHART 6.



Death-Rates for Certain Ages Per 100,000 Total Population for 1910.



Populations in Certain Ages Per 100,000 Total Population for 1910.

plete returns of her deaths, and, accordingly, I have carried this study farther.

One point on which great doubt with regard to death returns of the Pacific Coast is frequently expressed, is that of our infant mortality. We are told that the infant death-rate, especially in the city of Seattle, is so low that it indicates unjustifiable enthusiasm on the part of the health officer, and is, therefore, not worthy of consideration. Is there any evidence to support such an assumption? I maintain there is no such evidence. On the contrary there is evidence available that supports our death records relative to infant mortality. In Table VI you will find the population in each of the five primary ages of life per hundred thousand population. In Table VII you will find the death-rate per hundred thousand population for each of these ages. In Table VI you will find the per cent. of reduction in the number of people between under one year and one year of age. Note the reduction in Connecticut is 13.8 per cent., while that in Washington is only 4.4 per cent. Let us turn to Chart 6, where Table VI and VII are represented. Here you will note that the reduction in population between the under one year and one year of age period corresponds very closely with the death-rate per hundred thousand population, as represented in upper half of chart.

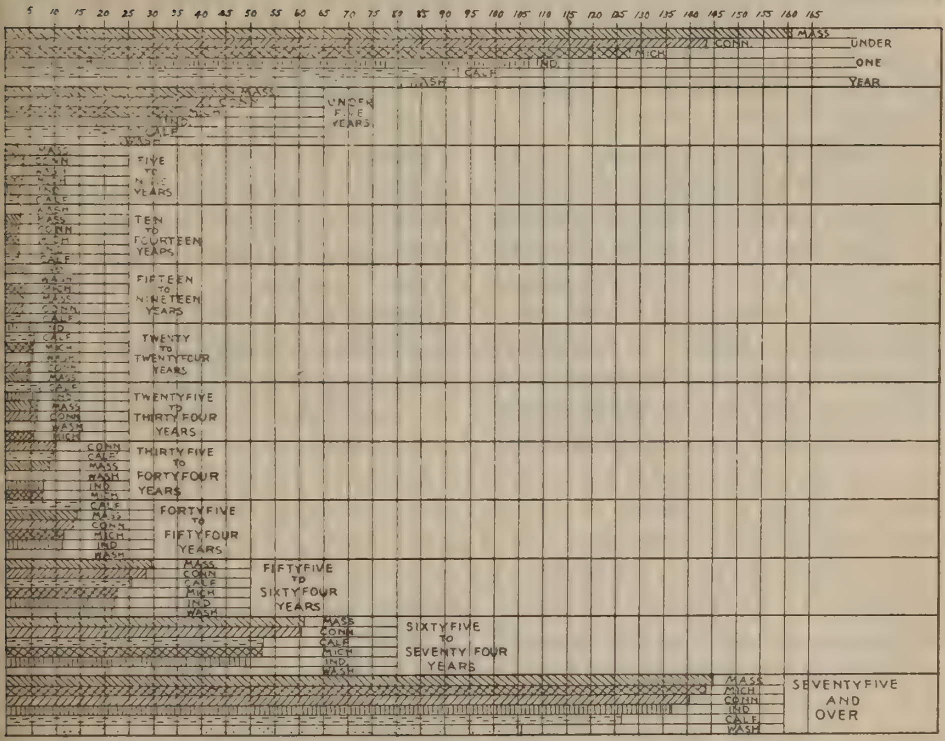
The reduction between the number of children under one year of age and that of those one year of age, can be accounted for only on the supposition that they died. Immigration and emigration cannot be taken into consideration on account of the fact that the variation is general throughout the United States.

The reduction in Connecticut being 13.8 per cent. and that in Washington being 4.4 per cent., the death-rate in Washington in infants under one year of age should be one-third that of Connecticut. As a matter of fact, our death returns show that our infant mortality is just about one-half that of Connecticut or Massachusetts.

Further evidence of the low death-rate in Washington and where and why. Please turn to Chart 7. In this chart I have used the same design to represent each state in the various age periods. Please note how Washington changes her relative position from the lowest in the periods under 5 years of age to that of not infrequently the highest between the ages of 5 and 50 years. These are the ages in which we have the greatest proportion of our population. Our death-rate in these ages is not a low one as compared to that of other states. However, this is a period of low death-rates in every locality. In the periods over 60, our death-rate is low.

I am thoroughly convinced that the death returns in Washington are complete. If our population is overestimated, then our death-rate as given by the United States Census Bureau is unduly low. But even with a reduced population estimate, we still show a death-rate of under 9.0. Is

CHART 7.



Deaths in 1910 from All Causes Per 1,000 Population of Given Ages.

this probable? I maintain that it is entirely reasonable and probable.

We note that in 1910, Massachusetts showed a death-rate of 16.6, and Connecticut a death-rate of 15.6, that Indiana showed a death-rate of 13.5 and Michigan a death-rate of 13.6. In other words, Michigan and Indiana showed a death-rate of approximately 3.0 per thousand less than Massachusetts or Connecticut. These death-rates are claimed as right and proper and the difference is acknowledged on the ground that a younger state, on account of the sparsely settled conditions, the lack of city slums, and on account of the average age of the population, will naturally show a lower death-rate than the older states.

If Michigan and Indiana, for these reasons, show a death-rate of 3.0 per thousand less than Massachusetts or Connecticut, what would be a just and proper death-rate for Minnesota or Missouri based on the same line of argument and what would be a proper death-rate for younger states of the Rocky Mountain district?

I maintain that a death-rate of less than 10.0 per thousand is perfectly reasonable in the young states and especially the states of the Pacific Coast. Our climatic conditions are especially favorable to the prolongation of the lives in the very young and very old.

A study recently made for me by Dr. Louis I. Dublin of the Metropolitan Life Insurance Company relative to deaths among holders of Industrial Insurance Policies in his company, which study will appear in the Eleventh Biennial Report of the State Board of Health, now in press, shows that the death-rate of these policyholders in the state of Washington was 6.6 per thousand for the period 1913 to 1915, as against a general death-rate of 10.8 per thousand.

In regard to infant mortality I quote Dr. C. L. Wilbur: "The chief difference, as I note, in the character of Washington mortality is the exceedingly low rate of deaths of children under 5 years of age and of infant mortality and the low rate of decedents 75 years and over. These low rates, I believe to represent facts, namely, that the infant mortality of Washington is exceedingly low because of the absence of the hot summers, cold winters, and other conditions leading to the spread of infectious diseases of children—undue prevalence of infantile enteritis, etc. There is an entire absence of slums and the crowded conditions of life incident thereto in the cities of the state, abundance of food, and conditions under which daily outdoor exercise and air are available for children. So that the low rate of infantile mortality and the consequent low death-rate of children under 5 years of age and also of older children, seems entirely reasonable under climatic and building conditions very similar to those which have produced the exceedingly low rates in New Zealand for this class of population."

The death-rate for the age period 10 to 34 in the state of Washington exceeds the death-rates for the corresponding age periods in England and Wales. For the age period 5 to 34, the death-rate in Washington exceeds that of New Zealand. The death-rate in the age period 45 to 74 in Washington, corresponds with that in England and Wales.

We believe then that a death-rate of 9.0 or less, in Washington, Oregon, Utah, Montana or any other of our very young states, and especially those located where the favorable climatic conditions in the Rocky Mountain and Pacific Coast States prevail, is not unreasonable, but on the contrary, if one of these states does not hold her death-rate at or below 10.0 per thousand population, she is justly entitled to condemnation for failure to take proper precautions to protect the health and lives of her people.

There is one portion of Washington, and the same condition prevails in practically all of our Western states, from which we do not receive proper death returns. I refer to those portions under federal government, namely, Indian reservations, forest reservations, military reservations, etc. Our state law does not extend over these districts, and yet the population thereon is included in the population of our state. In Washington the death returns from Indian reservations are gradually improving, but it does appear to me, as a worker in the field, that our federal government should see that every death and every birth that occurs on any reservation whatever, under federal supervision, is promptly and properly recorded with the registrar of births and deaths in the state in which such reservation is located.

As a result of this study I submit: First. The registration of deaths in the state of Washington is as complete as that in most, if not in any, of the states in the registration area.

Second. The low infant mortality in Pacific Coast states is an absolute fact and not a hallucination of overzealous health officers.

Third. A mortality of less than 10.0 in a young state is entirely right and proper and when the mortality exceeds 10.0 in our young states, investigation as to the precautions taken for the preservation of the health and lives in such states is entirely in order.

Fourth. That some method should be devised by the United States Census Bureau whereby reasonably accurate estimates of population may be made in sporadically growing states.

TABLE I.

Registration States.	Pop. in 1908 as estimated by U. S. Census Bureau from 1910 census.	Pop. in 1908 as estimated by U. S. Census Bureau in 1908.	Variation.
California	2,215,618	1,702,377	513,241
Colorado	751,973	640,861	111,112
Connecticut	1,077,319	1,038,149	39,170
Indiana	2,667,417	2,775,711	108,294
Maine	733,678	721,170	12,508
Maryland	1,275,878	1,304,566	28,688
Massachusetts	3,235,343	3,122,680	112,663
Michigan	2,724,734	2,639,050	85,684
New Hampshire	427,126	439,634	12,508
New Jersey	2,392,721	2,300,427	92,294
New York	8,729,074	8,546,356	182,718
Pennsylvania	7,417,816	7,137,315	280,501
Rhode Island	519,628	510,997	8,631
South Dakota	538,150	487,354	50,796
Vermont	353,721	352,617	1,104
Washington	1,028,794	646,799	381,995
Wisconsin	2,295,392	2,324,892	29,500
	38,384,382	36,690,955	1,872,417 178,990
	Total variation		2,051,407
	Apparent variation		1,693,427

TABLE I-A

DEATH-RATES PER 1,000 POPULATION, BASED ON POPULATION AS ESTIMATED FROM 1900 FORWARD, AND 1910 BACKWARD.

	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.
Boston	20.4 20.4	19.7 19.9	18.9 19.1	17.9 18.3	18.3 18.3	18.5 18.5	18.9 18.6	19.2 18.6	19.1 18.3
Detroit	16.3 16.3	15.3 15.3	15.6 15.6	15.8 15.8	14.9 14.9	14.4 13.8	17.0 15.7	16.5 14.9	15.6 13.7
Portland	10.2 10.2	12.4 11.3	11.7 10.0	12.7 10.2	13.5 10.3	13.7 9.7	13.5 9.4	16.5 11.0	15.3 9.9
Richmond	29.0 29.0	24.6 24.2	25.5 24.9	25.4 24.5	24.0 22.9	22.1 20.9	23.0 21.5	25.0 23.4	23.1 21.7
Seattle	11.1 11.1	10.8 9.7	12.3 10.2	12.1 9.5	12.6 9.3	11.5 8.1	12.7 8.5	15.7 10.8	.... 9.3
Indianapolis	17.1 17.1	15.4 15.4	14.3 14.1	15.8 16.0	16.4 16.7	14.1 14.6	14.6 15.1	15.2 15.8	13.5 14.2

TABLE II.

SHOWING DEATH-RATES BY AGES PER 100,000 POPULATION.

	Under 1.	1-9.	10-19.	20-29.	30-39.	40-49.	50-59.	60-69.	70-79.	80-89.	90 and over.
Washington	161	89	57	127	109	104	108	109	88	41	5
California	156	243	46	125	147	158	162	197	293*	..	..
Indiana	221	128	60	109	98	107	121	174	202	105	14
Michigan	280	409	50	101	91	102	130	180	307*	..	..
Massachusetts	338	488	49	99	122	137	163	212	339*	..	..
Connecticut	310	142	51	92	123	131	152	207	213	117	18

* Estimation in these states stopped at 70 instead of carrying it on to 90 and over.

TABLE III.

POPULATION IN VARIOUS AGES PER 100,000 TOTAL POPULATION.

	Under 1	1-9.	10-19.	20-29.	30-39.	40-49.	50-59.	60-69.	70-79.	80-89	90 and over.
Indiana	2,077	17,933	19,057	17,801	14,330	11,441	8,673	5,402	2,475	599	45
Connecticut	2,170	17,002	17,609	18,837	15,951	12,152	7,974	4,988	2,463	667	60
Washington	1,932	16,318	16,852	21,737	17,244	12,458	7,537	3,566	1,425	302	22

TABLE IV.

SHOWING POPULATION FOR EACH YEAR FROM 1900 TO 1913 AS ESTIMATED BY THE CENSUS BUREAU AND AS DETERMINED FROM DEATH RETURNS.

	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.
CALIFORNIA.														
Estimated from 1900	....	....	....	....	....	....	1,648,044	1,675,211	1,702,377	....	....	....	....	....
Estimated from 1910	....	....	....	....	....	....	2,034,859	2,125,238	2,215,618	2,305,998	2,396,378	2,486,757	2,577,137	2,667,516
Based on death returns	....	....	....	....	....	....	2,029,954	2,217,899	2,242,009	2,219,908	2,314,520	2,470,593	2,704,656	2,830,958
MICHIGAN.														
Estimated from 1900	2,420,982	2,448,240	2,475,498	2,502,757	2,530,061	2,557,275	2,584,453	2,611,790	2,639,050	....	....	....	....	....
Estimated from 1910	2,420,982	2,448,240	2,475,498	2,502,757	2,533,990	2,581,676	2,629,362	2,677,048	2,724,734	2,772,421	2,820,108	2,867,794	2,897,207	2,910,570
Based on death returns	2,451,050	2,455,525	2,357,351	2,449,315	2,599,369	2,600,913	2,700,821	2,794,520	2,730,228	2,736,064	3,009,862	2,916,429	3,021,598	3,137,534
MASSACHUSETTS.														
Estimated from 1900	2,805,346	2,861,986	2,918,626	2,973,266	3,031,906	3,003,680	3,043,346	3,083,013	3,122,680	....	....	....	....	....
Estimated from 1910	2,805,346	2,845,012	2,884,679	2,924,346	2,964,013	3,015,873	3,089,029	3,162,186	3,235,343	2,308,500	2,381,657	3,454,813	3,491,888	3,548,705
Based on death returns	2,970,312	2,886,918	2,869,513	2,950,781	2,952,343	3,069,531	3,058,593	3,333,046	3,134,687	3,141,093	3,328,906	3,271,799	3,294,375	3,365,156
WASHINGTON.														
Estimated from 1900	....	....	....	....	....	....	....	....	646,799	....	....	....	....	....
Estimated from 1910	....	....	....	....	....	....	....	....	1,028,794	1,091,973	1,155,152	1,218,330	1,281,508	1,344,686
Based on death returns	....	....	....	....	....	....	....	....	962,692	1,059,500	1,156,539	1,117,308	1,085,256	1,210,384
CONNECTICUT.														
Estimated from 1900	908,420	924,636	940,852	957,067	973,284	989,500	1,005,716	1,021,933	1,038,149	....	....	....	....	....
Estimated from 1910	908,420	931,055	951,949	972,844	993,739	1,014,634	1,035,529	1,056,484	1,077,319	1,098,214	1,119,109	1,140,005	1,160,898	1,181,993
Based on death returns	927,546	937,082	905,705	977,098	1,001,711	1,044,172	1,066,177	1,124,531	1,032,762	1,059,250	1,128,361	1,156,071	1,140,994	1,175,550
INDIANA.														
Estimated from 1900	2,516,462	2,548,868	2,581,274	2,613,680	2,646,086	2,678,492	2,710,808	2,743,305	2,775,711	....	....	....	....	....
Estimated from 1910	2,516,462	2,536,692	2,555,367	2,574,042	2,592,717	2,611,392	2,630,067	2,648,742	2,667,417	2,696,092	2,704,767	2,723,441	2,742,114	2,760,792
Based on death returns	2,571,789	2,685,439	2,517,593	2,413,650	2,733,367	2,673,418	2,604,347	2,663,700	2,619,212	2,651,769	2,756,319	2,779,272	2,883,215	2,884,539

TABLE V.

SHOWING POPULATIONS AS ESTIMATED FROM 1900 FORWARD TO 1908, BACKWARD AND FORWARD FROM 1910 AND AS DETERMINED FROM THE DEATH RETURNS.

	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.	1913.
Boston.														
Estimated from 1900	560,892	572,134	583,376	594,618	605,860	595,380	602,278	609,175	616,072	....	....	....	....	....
Estimated from 1910	560,892	567,789	574,686	581,584	588,482	597,908	613,075	628,242	643,409	658,576	673,744	688,911	711,128	722,465
Based on death returns	569,290	581,638	588,653	568,085	576,035	598,865	607,376	675,178	630,780	609,645	642,482	661,773	655,944	680,000
Detroit.														
Estimated from 1900	285,704	293,676	301,647	309,619	317,501	325,563	353,535	367,494	376,174	....	....	....	....	....
Estimated from 1910	284,704	293,676	301,647	309,619	319,332	340,224	381,116	407,439	428,332	449,225	470,118	493,040	503,445	520,586
Based on death returns	305,254	302,627	304,745	324,491	313,644	319,407	390,339	415,583	401,017	428,305	495,255	481,356	528,365	599,068
Indianapolis.														
Estimated from 1900	169,164	175,537	186,410	197,555	204,622	212,198	219,154	227,698	234,994	....	....	....	....	....
Estimated from 1910	169,607	174,928	180,249	194,870	200,191	206,013	211,335	218,246	223,813	229,135	234,759	240,080	246,928	253,668
Based on death returns	186,864	182,881	177,711	203,983	218,812	203,559	205,932	216,525	200,593	213,305	249,654	237,966	255,254	264,915
Portland.														
Estimated from 1900	90,426	93,169	95,912	98,655	101,398	104,141	109,884	112,757	Not Estimated					
Estimated from 1910	91,301	101,811	112,321	122,831	133,341	146,851	157,361	168,871	179,382	190,893	209,404	219,915	234,546	246,569
Based on death returns	87,901	113,580	109,506	123,333	137,777	142,222	145,555	184,320	178,864	184,765	231,358	245,185	230,123	253,580
Richmond.														
Estimated from 1900	85,050	85,416	85,782	86,148	86,514	86,880	87,246	106,227*	107,844	....	....	....	....	....
Estimated from 1910	85,164	86,540	87,916	89,292	90,668	92,044	93,421	113,413	114,790	116,167	127,914	129,290	131,453	133,185
Based on death returns	104,480	91,474	92,378	88,541	87,103	82,256	82,185	113,413	108,579	104,535	124,371	114,644	121,256	122,891
Seattle.														
Estimated from 1900	80,671	84,454	88,237	92,020	95,803	99,586	Not Estimated, See Note †							
Estimated from 1910	80,671	93,673	105,675	117,677	129,679	141,681	154,483	188,485	210,488	222,491	239,694	252,782	277,420	295,226
Based on death returns	95,000	91,579	116,579	116,052	120,131	117,500	137,763	212,894	204,868	230,263	253,947	233,026	248,289	269,868

* Apparently there was a new basis of estimation used for Richmond in 1907 and 1908 which variation was used in estimating both from 1900 and 1910.

† In the census reports for 1906 and 1907 it is noted that the population of Seattle is not estimated. However, on page 134 of the 1906 report we find that the death-rate for Seattle is placed at 12.7 and on page 150 of the 1907 report we find that the death-rate is placed at 15.7. It must be assumed that these are arbitrary death-rates as not only is it specified that the population was not estimated but had the same rate of increase been continued as used from 1900 to 1905 the death-rates for 1906 and 1907 respectively would be 14.5 and 19.0.

TABLE VI.

POPULATION IN CERTAIN AGES PER 100,000 TOTAL POPULATION AND PER CENT. OF DECREASE BETWEEN UNDER ONE AND ONE YEAR OF AGE IN 1910.

	Under 1.	1 year.	2 years.	3 years.	4 years.	Per cent. decrease from under 1 to 1 year of age.
Michigan	2,208	2,013	2,163	2,137	2,101	8.8
Connecticut	2,170	1,868	2,071	2,026	1,932	13.8
Massachusetts	2,101	1,846	2,006	1,974	1,840	12.1
Indiana	2,077	1,901	2,070	2,071	2,078	8.8
Washington	1,933	1,846	1,929	1,936	1,876	4.4
California	1,696	1,539	1,685	1,655	1,569	9.3

TABLE VII.

SHOWING DEATHS PER 100,000 TOTAL POPULATION IN FIRST FIVE YEARS.

	Under 1.	1 year.	2 years.	3 years.	4 years.
Washington	163	29	13	10	7
California	156	31	15	10	7
Indiana	222	53	24	13	10
Michigan	281	49	22	14	10
Massachusetts	338	64	24	17	11
Connecticut	312	55	25	16	12

TABLE IX.

PER CENT. OF DEATHS FROM PREVENTABLE DISEASES OF DEATHS FROM ALL CAUSES.

	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	Aver.	1910.	1911.	1912.	1913.
Connecticut	24.4	22.6	22.7	22.6	22.2	21.3	21.9	21.0	20.7	21.2	22.1	20.9	19.2	19.1	18.6
Indiana	25.9	24.4	25.9	25.0	24.5	23.1	23.7	23.1	23.5	24.0	24.3	25.2	21.9	20.2	22.2
Massachusetts	25.6	23.8	22.6	22.7	21.9	21.9	22.3	20.8	22.1	21.3	22.5	21.5	20.9	19.2	19.0
Michigan	20.9	18.1	18.3	19.0	17.2	17.5	19.8	15.9	18.1	17.3	18.2	17.8	15.9	14.6	15.8
California	....	....	....	....	....	....	22.5	21.8	21.4	21.4	21.8	22.0	20.4	19.3	19.7
Washington	....	....	....	....	....	....	....	....	21.5	22.8	....	21.5	19.6	16.8	17.1

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PREVENTION AND CURE OF VENEREAL DISEASES.

The history of the progress of medical knowledge and of ethical views with regard to venereal diseases illustrates not only an increasing appreciation of the individual's responsibility to himself, but also a growing conscience in him with regard to protecting others from the dangers of which he may be the direct agent. This growing sense of responsibility to the public was illustrated as long ago in England as 1866 when the "Contagious Diseases Act" was repealed and licensed immorality was condemned by the public conscience as being inexcusable and not to be condoned. The advance in our scientific knowledge of these diseases both as regards their causes and their prevention and cure has made the education of public opinion both easy and rapid as to what might be and ought to be done to lessen or prevent evils, whether physical or mental, growing directly out of these diseases or transmitted indirectly through heredity to later generations.

In a recent lecture by Dr. C. T. Macallister of Liverpool, before the Royal Institute of Public Health expression was given in the address and discussion after it to the various attitudes of medical opinion in Great Britain with regard to these diseases. Doctor Macallister thought "compulsory notification would be inadvisable at the present moment; it would be time for this when education had done its work and the quack had been cleared away." Dr. F. W. Mott spoke of the comparative efficacy of prophylactic treatment; while its value was urged by Dr. Otto May as a matter to be considered *in se* and wholly apart from the ethical question of prevention through self-control. One of the first medical officers of health, Dr. H. R. Kenwood insisted that so soon as the routine of official notification of cases had been provided for and the Regulations of the Local Government Board under the recent Imperial Act put in force its provisions for preventing chemists and quack practice must be rigidly enforced.

The Local Government Board Regulations provide for arrangements to be made by all borough and county Boards of Health with hospitals within their areas, for the establishment of free clinics and the appointment of selected clinicians, both to diagnose and administer some approved form of salvarsan. They provide further that all physicians must notify the local Board of Health under a registered number of every venereal case under their care, while if such desire it they can obtain the free administration of salvarsan for their patients by the official clinician of the district. The physician on notifying a case will receive literature with instructions for his patient with regard to his personal hygiene and which warn him of the penalties for exposing any person, while he is under treatment, to the danger of infection. The patient must further notify his physician or the local authorities of any change of his abode so that they may be assured that his treatment will be continued. Provision is even made for the free transport of sick persons to hospitals for free treatment if otherwise they would be unable to go. The Local Government Board provides that 75 per cent. of the total cost of all this will be borne by the Imperial Government and the balance by the municipalities.

This remarkably thorough organization for dealing with social diseases is the outcome of the report of the Royal Commission, which contains statistics and facts regarding the situation, full of interest and illustrative not more of the conservative way in which legislation is undertaken in Great Britain in matters affecting the liberty of the citizen than of the scientific and thorough manner in which legislation when once enacted is put in force. The elevated ideas along social lines which prevail in Parliament are well illustrated when they accept the findings of a scientific commission as a sufficient guide to them in passing legislation of so drastic a character as that in recent acts.

It is probably true that on the American continent similar legislation is more readily obtained when public agitation has been worked up than in England; but the practical difficulties in its enforcement are usually found not more in the refusal of the general public to submit to drastic regulations than in the extremely varied character of our administrative machinery. It is true that in most states and provinces local Boards of Health are appointed, while in probably all such the boards in cities and towns where hospitals are located have fairly adequate public health by-laws. What is, however, altogether too prevalent is the evil of temporary political appointments of health officers, with in consequence, tenures of office unfortunately very uncertain. If, however, state legislation of an adequate character, such as that recently passed in England, is effected with regulations for compulsory notification and scientific treatment of cases in hospital clinics, and if provisions are made for supervising the general hygiene and movements of patients until treatment is completed, then the first real steps in advance in the solution of this, the most difficult of all public health problems, will have been taken.

A STUDY OF THE APPLICATION OF THE SCORE SYSTEM TO THE SANITARY QUALITY OF PUBLIC WATER SUPPLIES IN NEW YORK STATE.

Theodore Horton, *Chief Engineer* and E. Sherman Chase, *Assistant Engineer, New York State Department of Health.*

Read before the Sanitary Engineering Section of the American Public Health Association, Cincinnati, Ohio, October 25, 1916.

IN THE State of New York there are approximately 500 public water supplies, of which some 300 are from surface sources and some 200 from ground water sources. Although these supplies are only partially under the jurisdiction of the State Department of Health, this department has, however, always exercised a general supervision over them. It is only in the last 10 years, during which time the Engineering Division has been in existence, that particular attention has been paid to this supervision. During this period the physical and sanitary conditions of some 400 of the 500 supplies have been carefully investigated and reported upon. These investigations have included field inspections, gathering of local statistics, laboratory analyses and office studies and reports with recommendations for needed improvements.

With so large a number of supplies under supervision it was considered desirable, for many reasons, that some convenient method of rating the sanitary character of these supplies, according to some definite quantitative measure, should be worked out and our endeavor in this direction lead to the following study:

There are three factors or measures which may be considered as fundamental in rating the sanitary quality of a water supply, namely: Contamination on the water shed; natural agencies or artificial means tending to counteract or correct this contamination; and the efficacy of these agencies as determined by laboratory analyses.

In making this study it was found that the water supplies of New York State could be classified according to three groups, as follows:

Group (1) Surface water supplies, excluding supplies from the Great Lakes, the Niagara and St. Lawrence Rivers.

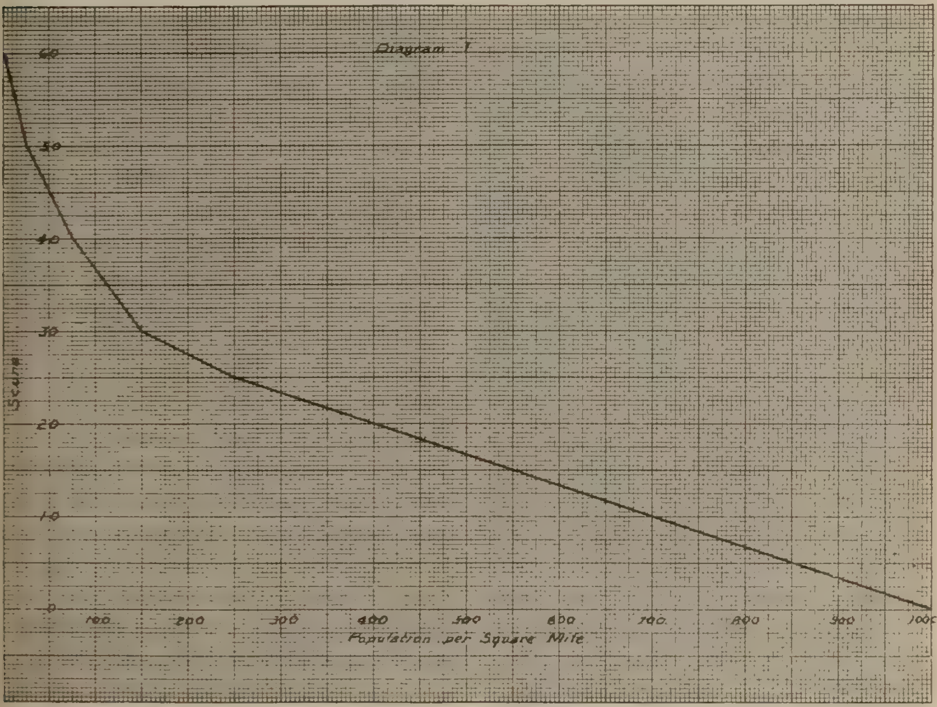
Group (2) Water supplies from the Great Lakes, the Niagara and St. Lawrence Rivers.

Group (3) Ground water supplies.

In each group, however, the same general formula was applied which was expressed as follows:

$S=A+B-C$, in which S is the "Score" representing the sanitary quality of the supply on a 100 per cent. scale; A, a factor representing the condition of pollution of the water shed; B, a factor representing natural or artificial means of purification or protection against pollution; C, a factor representing the efficiency of this purification in the nature of a penalty based on the prevalence of B. coli in the water as delivered.

In respect to the factor A, it is evident, in the case of surface water supplies, that the only rational measure of pollution is the resident population upon the watershed and that the intensity of this pollution should be considered as proportional to the density of population, due account being taken of whether the contamination is direct or indirect. For the purpose of this study, then, values have been assigned to water supplies from surface sources according to the density of population upon the watershed, these values ranging from a maximum of 60 for an unpopulated watershed down to 0 for a watershed with a population of 1,000 per square mile. In ascribing a population per square mile, allowance has been made for direct or indirect pollution by multiplying the population contributing directly (*i. e.* by direct sewage discharge) by 5 before selecting a figure to be used for the purpose of scoring. In other words the figures for population per square mile given in the appended tables do not represent the actual population but are made up of the resident population not discharging directly, *i. e.* indirect contamination, plus 5 times the population discharging sewage directly, the relative danger of the two being assumed in the ratio of 1 to 5. While the apparently low figure assigned to an unpopulated watershed may seem somewhat rigorous it must be recognized that an uninhabitated



watershed has been generally considered to be always subject to contamination of an accidental, incidental or wilful nature from chance visitors upon the watershed. The values for factor A have been plotted in a curve given in the appended Diagram No. 1.

In the case of the supplies from the Great Lakes and the Niagara and St. Lawrence Rivers it is evident that the density of population on the watershed is of practically little significance in determining the quality of the supply derived from these sources. The principal factor to be considered is the direct contamination within a certain distance of the point of intake. For the purpose of this study it has been assumed that a population of 100,000 discharging raw sewage at a distance of one mile from the intake corresponds to an intensity of population on the watershed of 1,000 per square mile and that the danger arising from such population is inversely proportional to the distance at which the points of contamination are from the intake. In the lakes the limit at which the effect of population will be negligible has been set at 20 miles, this limit agreeing fairly closely with the results of observations of pollution in the Great Lakes. In the case of the rivers all pollution entering the river and affecting the supply is taken into consideration. In the case of this whole group, after obtaining the equivalent population on the watershed, the curve used in the case of Group (1) is applied.

In the case of ground water supplies from wells the watershed has been considered as equivalent to the area of the base of the cone of depression tributary to the supply, this area having been restricted to that of a circle with a radius of 1,000 feet. In the case of spring supplies the watershed has been considered as being the surface watershed tributary to the point at which the spring is situated. These areas have been divided into three zones and the relative importance of sources of contamination upon these zones has been taken into consideration by multiplying the population in the different zones by factors varying inversely with the distance from the source of supply, before equating the figures for population in terms of density of population per square mile on the water shed. After obtaining comparable figures for density of population per square mile on the watershed the curve used in the case of Group (1) may be applied.

With respect to factor B, the natural agencies or artificial means which will tend to counteract the presence of contamination on the watershed are given positive values in the scoring system according to their reliability. In the case of surface waters the maximum score for any single method of purification is assigned to slow sand filtration and the minimum to storage of one week's duration. Storage, in the case of surface waters has not been given a high rating because of the continued presence of uncertainties with respect to the actual amount of storage, due to currents induced by wind and other causes. In case two or more methods of purification are employed the total score for purification has been considered as the sum of the scores of each method. No combination, however, to be credited with a score above 40.

With ground water supplies the passage of the water through the soil has been considered equivalent to purification and scores have been arranged accordingly, the scores ranging from a maximum of 40 for wells or springs situated in sand to a minimum of 20 for those situated in solvent rock.

Considering factor C, it may be explained that without proper control of the efficiency of operation even the best method of safeguarding the sanitary quality of the supply would be practically useless. The only way that seemed available and at the same time rational for measuring this control was through the use of bacteriological analyses applied as a penalizing factor in the score. To accomplish this minus values have been assigned and deductions made according to the relative presence of B. coli in the samples of the water. With ground water supplies the penalty for bacteriological results has been doubled on account of the greater significance of bacterial analyses as an indication of the sanitary quality of underground waters.

The following is a summary of the method of scoring which has been tentatively adopted in this study:

METHOD FOR SCORING WATER SUPPLIES.

General formula: $S=A+B-C$.
Where S = Score
A = Condition of pollution of the watershed.
B = Methods of protection or purification.
C = Penalty based upon B. coli results.

CASE I. SURFACE WATER SUPPLIES.

Factor A. Values for this factor are to be taken from the curve of population per square mile, the values ranging from 60 for an unpopulated watershed to 0 for a population of 1,000 per square mile. The figure for population per square mile in this case is to be made up of the sum of the population contributing sewage directly and indirectly, the population contributing directly being first multiplied by 5.

Factor B. Values for this factor will depend upon the means of purification, as follows:

Slow sand filters	20
Sterilization	15
Gravity mechanical filters	15
Pressure mechanical filters	10
Storage (2 wks.)	10
Storage (1 wk.)	5

For combined methods of purification add individual scores but allow no greater than 40.

Deduct 5 in case no coagulant is used with mechanical filters.

Factor C. Penalty for B. coli results deduct one-tenth the sum of:

Per cent. of samples with B. coli present in 10 c.c.
Per cent. of samples with B. coli present in 1 c.c.
Per cent. of samples with B. coli present in $^1/_{10}$ c.c.

CASE II. GREAT LAKES SUPPLIES, NIAGARA AND ST. LAWRENCE RIVERS.

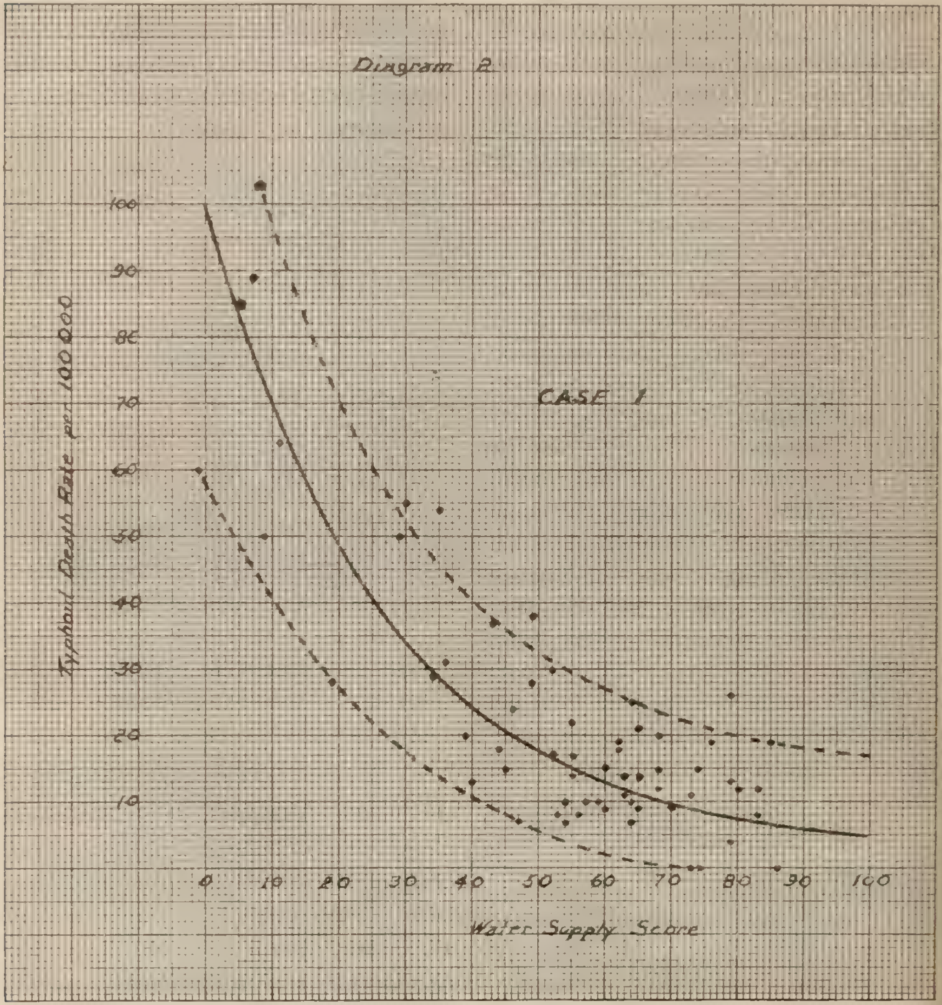
Factor A. In assigning values for this factor, consider that a population of 100,000 discharging sewage into the body of water within 1 mile of the intake is equivalent to a population of 1,000 per square mile and that the danger from such pollution is inversely proportional to the distance beyond 1 mile. In case of the lake supplies consider also that the limits at which pollution will affect the supply is 20 miles. In the case of the rivers all pollution reaching river and affecting the supply is to be considered.

The equivalent population per square mile will then equal $\frac{P}{100 \times D}$ in which

P = Population discharging sewage.
D = Distance from intake in miles.

Factor B. Purification was with Case I.

Factor C. Analytical Penalty as with Case I.



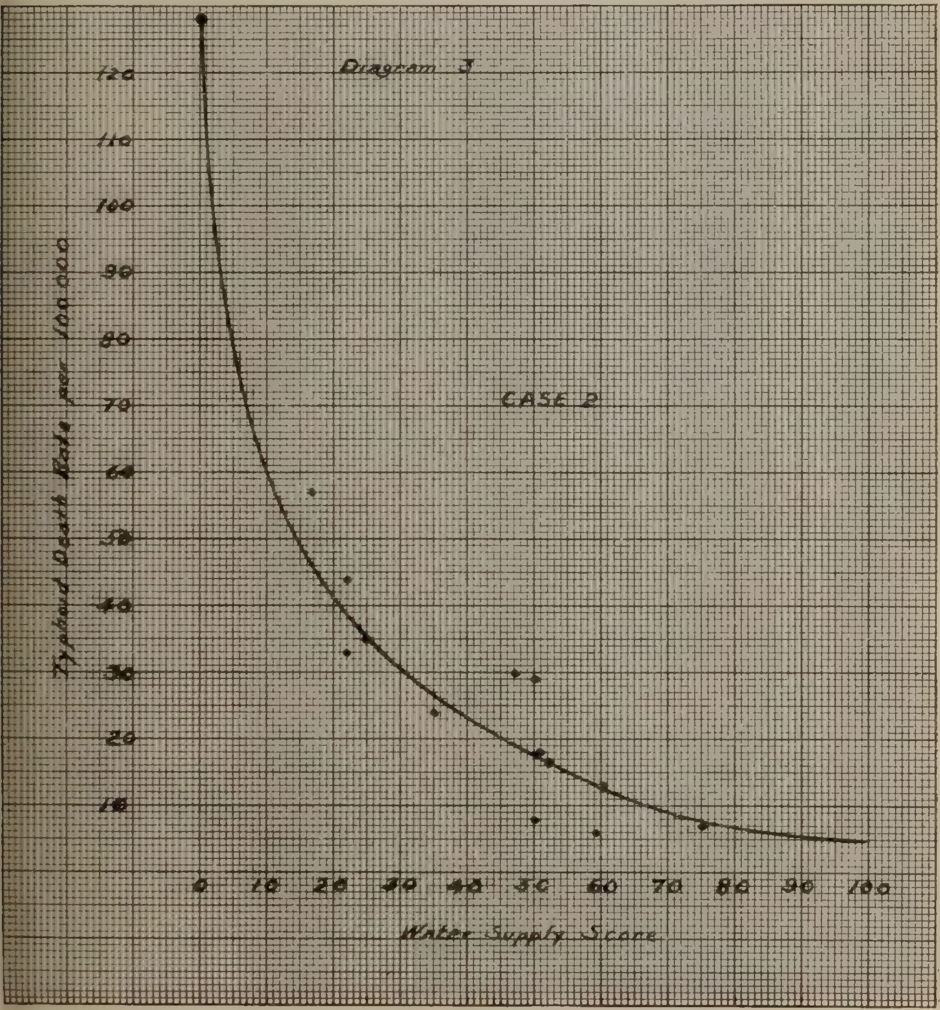
CASE III. GROUND WATER SUPPLIES.

Factor A. In assigning values for this factor each source of pollution within 100 feet is to be considered equivalent to a population of 20 per square mile; beyond 100 feet and within 500 feet, equivalent to 10 per square mile; and beyond 500 feet and within 1,000 feet equivalent to 5 per square mile. Use curve for Case I in determining Factor A.

Factor B. The value for this factor will depend upon the natural character of the material in which the springs or wells are located, as follows:

Sand	40
Loam	35
Clay	30
Fissured Rock and Gravel	25
Solvent Rock	20

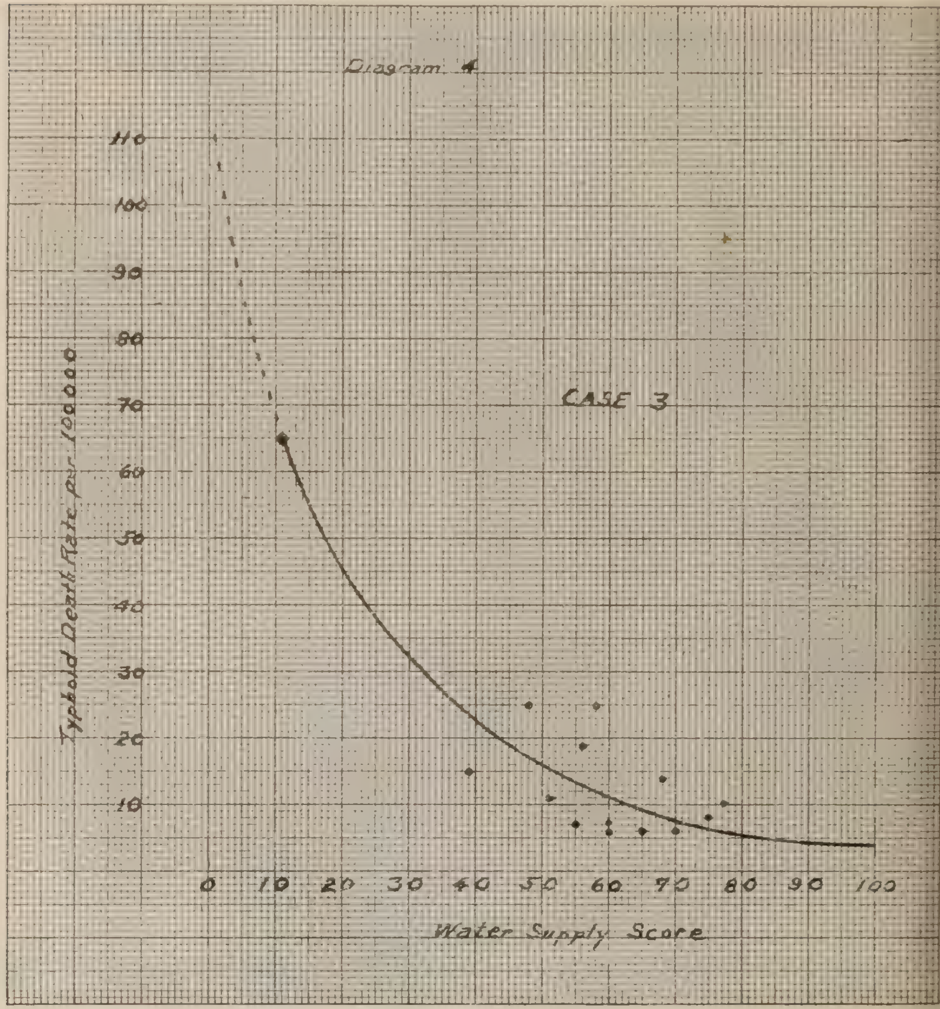
If artificial means of purification are used, assign values as for Case I.



Factor C. Penalty for B. coli results.

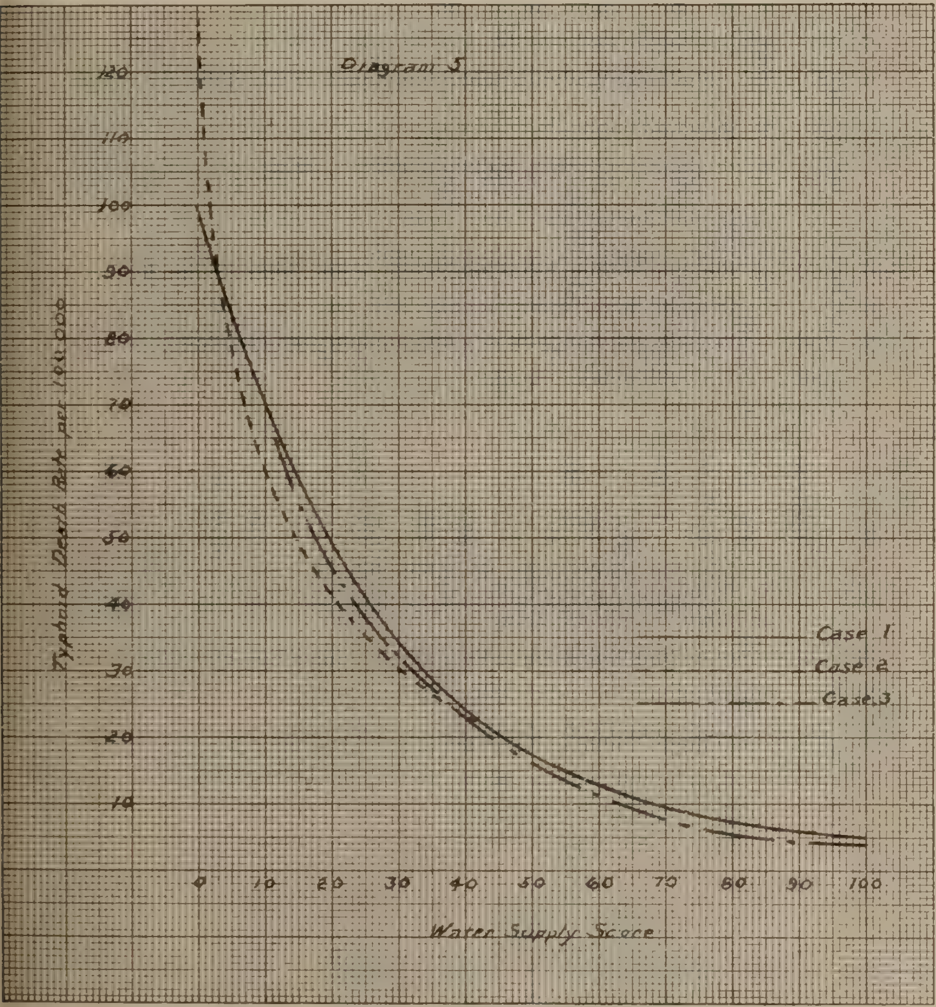
Double that of Case I.

The results of the scoring of some 90 public water supplies in New York State are given in the appended table, together with the typhoid fever death-rates for the municipalities served by these supplies. In some cases two scores are given for the same municipality owing to the fact that information was available regarding the supply before and after changes or improvements. In such cases, however, the typhoid rates are those for the years in which the supplies were in the condition scored. The supplies scored include only those for municipalities of 5,000 population or upwards, although it is intended to score all of the remaining supplies in New York State.



The tabulated results have been plotted in curves, also appended, which show more strikingly the relation between the scores and the typhoid fever death-rates as well as the applicability of the score system. The curves for the scores of the three groups of supplies were plotted independently and are shown in diagrams 2, 3, and 4. After these three curves were plotted they were superimposed with the result shown in diagram 5. The practical coincidence of the three curves indicates the approximate correctness of the values assigned for the various factors used in the general formula for scoring.

In conclusion it should be stated that the foregoing study for a score system of the sanitary quality of public water supplies is presented as tentative only and that the figures assigned for the different factors are, for the time being, merely suggestions. The scores actually obtained, however, correspond in a general way so closely with our knowledge of the sanitary qualities of the supplies secured through field investigations and compare so closely with the typhoid fever death-rates, as to convince us of the practicability of the application of the score system to the water supplies of New York State. A continuation of our studies in connection with this score system, will no doubt enable us to make such modifications in the values of the several factors as to make the final scores even more consistent with our knowledge of the quality of the supplies and the corresponding typhoid fever death-rates.



SCORES OF WATER SUPPLIES OF MUNICIPALITIES IN NEW YORK STATE WITH POPULATIONS OF 5,000 OR OVER.

Case I.

Place.	Pop. per sq. m.	A.	Treatment.	B.	Per cent. samples with B. coli present.			C.	Final score.	Typhoid rate.
					10 cc.	1 cc.	1/10 cc.			
Albany	280	24	G. F. & S. F., Ster.	40	0	0	0	0	64	12
Albany, Before 1900	190	28	None	0	*100	*100	0	20	8	89
Albion	47	46	Stor., G. F., Ster.	40	0	0	0	0	86	0
Amsterdam	0	60	Stor.	10	70	0	0	7	63	11
Auburn	51	45	Stor., Ster.	†.10	0	0	0	0	65	14
Batavia	44	46	None	0	100	100	60	26	20	28
Beacon	33	49	None	0	90 (100)	50 (40)	0	14	35	29
Binghamton	75	40	G. F., Ster.	30	17	0	0	2	68	12
Binghamton, Before 1902	50	45	None	0	100	50	0	15	30	50
Canandaigua	38	48	Stor.	10	25	0	0	3	55	22
Catskill	330	22	None	0	100	100	33	23	– 1	60
Cohoes	330	22	G. F., Ster.	30	20	0	0	2	50	28
Cohoes, Before 1911	220	26	None	0	100	*100	*0	20	6	85
Elmira	25	50	G. F., Ster.	30	0	0	0	0	80	12
Elmira, Before 1896	18	51	None	0	100	*50	*0	15	36	54
Fredonia	33	48	Stor.	10	90 (100)	70 (80)	20 (0)	18	40	20
Geneva	94	37	Stor., S. F.	30	70	0	0	7	60	15
Geneva, Before 1914	94	37	Stor.	10	100	*0	*0	10	37	31
Glens Falls	0	60	Stor.	10	80	0	0	8	62	18
Gloversville	15	54	Stor.	10	50	0	0	5	59	10
Haverstraw	20	51	Stor.	10	100	50	15	17	44	18
Hornell	45	46	P. F., Ster.	25	50	20	0	7	64	10
Hornell, Before 1900	45	46	None	25	*100	*50	0	15	31	55
Hudson	30	49	Stor., S. F., Ster.	40	80	20	0	10	79	26
Ilion	40	47	Stor., S. F.,	30	40	0	0	4	73	11
Ithaca	50	45	Stor., G. F., Ster.	40	0	0	0	0	85	19
Ithaca, Before 1903	50	45	None	0	*100	*50	0	15	30	35
Johnstown	1	59	Stor. (1 wk.)	5	80	30	0	11	53	8
Kingston	30	49	Stor., P. F., Ster.	35	7	0	0	1	83	8
Little Falls	10	56	Stor.	10	85	33	25	14	52	17

* Estimated.

† Two-thirds credit for intermittent sterilization.

Case I. *Continued.*

Place.	Pop. per sq. m.	A.	Treatment.	B.	Per cent. samples with B. coli present.			C.	Final score.	Typhoid rate.
					10 cc.	1 cc.	1/10 cc.			
Middletown	5	58	Stor., G. F.	25	0	0	0	0	83	12
Mt. Vernon	150	30	Stor. F., Ster.	40	50	0	0	5	65	9
Newburgh	30	49	Stor., Ster.	25	0	0	0	0	74	15
Newburgh, Before 1914	30	49	Stor.	10	100	0	0	10	49	38
New Rochelle	70	41	Stor., Ster.	25	70	30	0	10	56	8
New York	67	41	Stor., Ster.	25	20	0	0	2	64	7
New York, Before 1913	67	41	Stor.	10	*50	*0	0	5	46	15
North Tarrytown	50	45	Stor., P. F., Ster.	35	50	20	0	7	73	0
Norwich	30	49	A. F. Ster.	25	40	0	0	4	70	9
Oneida	40	47	Stor.	10	100	0	0	10	47	7
Oneonta	10	56	P. F., Ster.	25	40	10	0	5	76	19
Ossining	45	46	Stor., Ster.	25	30	0	0	3	68	20
Peekskill	42	46	S. S. F.	20	60	0	0	6	60	9
Perry	100	37	Stor.	10	40	15	0	6	41	13
Plattsburgh	20	51	Stor. (1 wk.)	5	100	30	0	13	43	37
Port Chester	30	49	Stor., P. F.	20	60	10	0	7	62	18
Port Jervis	0	60	Stor.	10	50	0	0	5	65	21
Poughkeepsie	310	23	Ster., S. F., Ster.	40	0	0	0	0	63	14
Rensselaer	280	24	G. F., Ster.	30	0	0	0	0	54	7
Rensselaer, Before 1902	190	28	None	0	100	100	0	20	8	103
Rochester	32	49	Stor.	10	20	0	0	2	57	10
Rome	10	56	Stor.	10	80	30	0	11	55	17
Saratoga	31	49	Stor.	10	50	10	0	6	53	30
Seneca Falls	31	49	Stor., P. F.	25	0	0	0	0	74	0
Syracuse	40	47	Stor.	10	20	0	0	2	55	14
Tarrytown	165	29	Ster., Stor., P. F., Ster.	40	50	0	0	5	64	25
Troy	30	49	Stor.	10	100	30	0	13	46	24
Utica	10	56	Stor., Ster.	25	20	0	0	2	79	4
Watertown	20	51	G. F., Ster.	30	20	0	0	2	79	13
Watervliet	350	21	S. F.†	13	100	100	50	25	9	50
White Plains	1	59	Stor.	10	10	0	0	1	68	15
Yonkers	208	27	S. F., Ster.	35	20	0	0	2	60 } 54	10
	40	47	Stor.	10	100	0	0	10	47	

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* Estimated.

† Two-thirds credit for intermittent operation.

CASE II.

Place.	Pop. per sq. m.	A.	Treatment.	B.	Per cent. samples with B. coli present.			C.	Final score.	Typhoid rate.
					10 cc.	1 cc.	1/10 cc.			
Buffalo	50	45	Ster.	15	0	0	0	0	60	13
Buffalo, Before 1913	50	45	None	0	100	0	0	10	35	24
Dunkirk	100	37	Ster.	15	0	0	0	0	52	17
Dunkirk, Before 1915	100	37	None	0	70	40	10	12	25	35
Lackawanna	35	47	Ster.	15	33	0	0	3	59	6
Lockport	100	37	Ster.	15	20	0	0	2	50	8
Lockport, Before 1914	100	37	None	0	90	50	10	15	22	33
Niagara Falls	275	25	G. F., Ster.	30	50	0	0	5	50	29
Niagara Falls, Before 1911	275	25	None	0	100	100	50	25	0	128
N. Tonawanda	100	37	Ster.	15	50	0	0	5	47	30
N. Tonawanda, Before 1915	100	37	None	0	100	100	0	20	17	57
Ogdensburg	10	55	S. F.	20	0	0	0	0	75	7
Oswego	100	37	Ster.	15	20	0	0	2	51	18
Tonawanda	100	37	None	0	100	50	0	15	22	44

CASE III.

Corning	80	39	Well in gravel	25	30	0	0	6	58	25
Cortland	70	41	Well in gravel	25	30	20	0	10	56	19
Fulton	90	38	Gravel	25	50	25	0	15	48	25
Glen Cove	150	30	Sand	40	50	0	0	10	60	6
Hicksville	155	30	Sand	40	0	0	0	0	70	6
Huntington	100	37	Sand	40	0	0	0	0	77	10
Jamestown	115	35	Gravel	25	10	0	0	2	68	14
Johnson City	170	29	Gravel	25	50	20	0	15	39	15
Medina	35	48	Limestone	20	35	5	0	8	60	7
Newark	70	41	Loam	35	100	0	0	20	56	7
Olean	75	40	Gravel	25	15	5	0	4	51	11
Sea Cliff	115	35	Sand	40	50	0	0	10	65	6
Walden	375	21	Fiss. Rock	25	50	0	0	10	11	65
Schenectady	25	50	Gravel	25	0	0	0	0	75	8

BACILLUS COLI IN MILK—A PRELIMINARY REPORT.

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City Bacteriologist and Pathologist, St. Louis, Mo.

Read before the Laboratory Section of the American Public Health Association, Rochester, N. Y., September 9, 1915.*

DURING the summer months of 1914 a controversy arose as to the presence or absence of B. coli in the municipal water of St. Louis. At this time one department was using the methods which they had been using for several years previously and another department was using different methods. The results differed. Eventually the controversy was settled but during this time the study of the literature showed that there had been many standards of isolating this group and that some of these methods differed distinctly from others. With these facts in view, the author of this work attempted a correlation, as it were, of the different methods, with the idea of either harmonizing or possibly inducing new methods of isolation or separating the different members of this group. In order to do so he attempted to isolate as many as possible of the various members of milk, feces, urine, etc.

In isolating these organisms and carrying them through the different media, there seemed to be several things brought out which seem well worth reporting at this time.

Technique.

Preparations of Material.—The basis of all materials was the standard meat extract bouillon in which during the early part of the work Leibig's meat extract was used. Later, owing to the unusual conditions prevailing, a comparative work was undertaken with Armour's meat extract and after the results were compared, the results being identical, the latter extract of meat was used as it was more easily obtained. All other chemicals were Merck's or Schuchardt's.

For the sugar and other fermentative media, sugar free broth was used to which was added the special substance to be fermented in proportion of one per cent and later in one-fourth per cent. The indol reactions were made from four-day cultures in Dunham's pepton media, made from Witte's pepton, which pepton was also used in all the other work. The Vokes-Proskaur method was used in meat-extract-free dextrose-pepton solution in the usual and ordinary way. The test for indol was made according to the Ehrlich method.

The materials from which cultures were made were milk, urine, feces and foods sent to the laboratory in suspected ptomaine poisoning cases. For this particular work the cultures used were made from 34 samples of certified milk, 11 samples of Pasteurized whole milk, 82 samples of whole milk, non-Pasteurized, 73 samples of non-Pasteurized skimmed milk, and 10 samples of Pasteurized skimmed milk. The milks were plated on plain agar in different dilutions, and one cubic centimeter of milk was inoculated into lactose and dextrose bouillon. The plates were counted and the reaction read in forty-eight hours and sub-cultures were made from deep lenticular or characteristic surface colonies into bouillon. If there had been fermentation in the lactose or dextrose bouillon, or both, sub-plates were made from these media, from which bouillon cultures were made after forty-eight hours. From the plate bouillon cultures or from the lactose-plate-bouillon cultures or from the dextrose-plate-bouillon, culture inoculations were made into lactose or dextrose bouillon. In forty-eight hours these reactions were read. If fermentation had taken place in lactose or dextrose bouillon in any of the tubes, cultures were then made in salicin, mannite, dulcite, adonit, glycerin, inulin, corn starch, potato starch, sacchrose, levulose, raffinos, rhamnos, maltos, galactos, mannos, arabinos, and xylose, all of these being in sugar free broth bouillon, one-fourth of one per cent. Stab cultures were also made in agar and in gelatine, slant cultures were made on agar, and cultures were made in pepton solution and in plain bouillon. These cultures were incubated for twenty-four hours and then left at room temperature for three more days after which the results were tabulated; they were then put aside and checked at the end of not less than thirty days, when comparative differences, if any, were noticed.

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*An unfortunate error in the filing of the manuscripts in the Journal office has caused this regrettable delay in the publication of this valuable article.—Editor.

It is not the purpose of the author to go into an exhaustive survey of literature in this, the preliminary report, suffice to say that the classification of the organisms as found in this work based upon the article by Bergey and Deehan,* which depends upon as conclusive and final classification, presence or absence of fermentation, saccharose, dulcite, adonit and inulin, with presence or absence of liquefaction in gelatin, presence or absence of a positive Vokes-Proskaur reaction and the presence or absence of the indol reactions.

There have been previously reported organisms corresponding to 3, 4, 6 and 8. In the work of the author organisms corresponding to 2, 4, 6, 8, 10 and 12 have been found.

Organisms which were found according to the author corresponding to No. 4, when grown in other media not mentioned in this table are found to show the following difference: One organism is positive for salicin and the other negative for salicin, showing that these organisms are different according to finer analysis.

There have been previously reported organisms 18, 19, 20, 22, 26, 28 and 31. In the work of the author the organisms corresponding to 20 were found once, 28 was found once, and 30 was found three times.

On finer analysis organisms corresponding to No. 30 found by the author show that one organism ferments salicin but does not ferment glycerin, rhamnos or raffinos. A second does not ferment salicin nor raffinos, but ferments glycerin and rhamnos, while a third does not fer-

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* *Journal of Medical Research*, 1908, XIV, p. 175.

GROUP I.

No.	Name.	Saccharose.	Dulcit.	Adonit.	Inulin.	Per cent. of Gas	H/CO_2	Gelatin.	V/P.	Indol.	Motility.	Milk.	Sewage.	MacConkey.
1	....	....	....	....	....	60	3/2	....	....	....	....	....	....	1
2	....	....	....	....	....	....	....	....	....	....	+	....	....	....
3	....	....	....	....	....	45	3/1	....	....	+	....	1	....	3
4	Bacillus grunthal	....	....	....	....	50	2/1	....	....	+	+	3	....	1
5	....	....	....	....	....	....	....	....	+	....	....	....	....	....
6	....	....	....	....	....	50	1/2	....	+	....	+	5	....	....
7	....	....	....	....	....	....	....	....	+	+	....	....	....	....
8	....	....	....	....	....	50	2/3	....	+	+	+	5	....	....
9	....	....	....	....	....	....	....	+	....	....	....	....	....	....
10	....	....	....	....	....	....	....	+	....	....	+	....	....	....
11	....	....	....	....	....	....	....	+	....	+	....	....	....	....
12	....	....	....	....	....	....	....	+	....	+	+	....	....	....
13	....	....	....	....	....	....	....	+	+	....	....	....	....	....
14	....	....	....	....	....	....	....	+	+	....	+	....	....	....
15	....	....	....	....	....	....	....	+	+	+	....	....	....	....
16	....	....	....	....	....	....	....	+	+	+	+	....	....	....

GROUP II.

No.	Name.	Saccharose.	Dulcit.	Adonit.	Inulin.	Per cent. of gas.	H/CO_2.	Gelatin.	V/P.	Indol.	Motility.	Milk.	Sewage.	MacConkey.
17	....	+	....	....	....	....	....	....	....	....	....	....	....	....
18	....	+	....	....	....	30	2/1	....	....	....	+	2	....	....
19	Bacterium coscorobae	+	....	....	....	30	2/1	....	....	+	....	....	....	....
20	....	+	....	....	....	40	3/1	....	....	+	+	1	....	....
21	....	+	....	....	....	....	....	....	+	....	....	....	....	....
22	....	+	....	....	....	60	2/1	....	+	....	+	2	....	....
23	....	+	....	....	....	....	....	....	+	+	....	....	....	....
24	....	+	....	....	....	....	....	....	+	+	+	....	....	....
25	....	+	....	....	....	....	....	+	....	....	....	....	....	....
26	....	+	....	....	....	20	3/1	+	....	....	+	1	....	....
27	....	+	....	....	....	....	....	+	....	+	....	....	....	....
28	Bacillus vulgaris	+	....	....	....	20	2/1	+	....	+	+	....	....	....
29	....	+	....	....	....	....	....	+	+	....	....	....	....	....
30	Bacillus cloacae	+	....	....	....	75	1/1	+	+	....	+	....	8	2
31	....	+	....	....	....	....	....	+	+	+	....	....	....	....
32	....	+	....	....	....	....	....	+	+	+	+	....	....	....

ment salicin nor glycerin but does ferment rhamnos and raffinos, showing that there is a distinct difference between the three organisms of this group which according to the Bergey method were the same.

The organisms previously reported corresponding to 34, 35, 36, 38 and 44. In the work of the author organisms corresponding to 34 were found once, 36 seven times, 38 once, 42 twice, 44 five times, 46 once and 48 once.

GROUP III.

No.	Name.	Saccharose.	Dulcit.	Adonit.	Inulin.	Per cent. of gas.	H/CO₂	Gelatin.	V/P	Indol.	Motility.	Milk.	Sewage.	MacConkey.
33	....	....	+	....	....	....	....	....	....	....	....	....	....	....
34	Bacillus enteritidis	....	+	....	....	50	2/1	....	....	....	+	....	....	1
35	....	....	+	....	....	30	3/1	....	....	+	....	1	....	5
36	Bacillus coli verus	....	+	....	....	25	2/1	....	....	+	+	....	4	2
37	....	....	+	....	....	....	....	....	+	....	....	....	....	....
38	....	....	+	....	....	35	2/1	....	+	....	+	2	....	....
39	....	....	+	....	....	....	....	....	+	+	....	....	....	....
40	....	....	+	....	....	....	....	....	+	+	+	....	....	....
41	....	....	+	....	....	....	....	+	....	....	....	....	....	....
42	....	....	+	....	....	....	....	+	....	....	+	....	....	....
43	....	....	+	....	....	....	....	+	....	+	....	....	....	....
44	....	....	+	....	....	25	3/1	+	....	+	+	....	....	3
45	....	....	+	....	....	....	....	+	+	....	....	....	....	....
46	....	....	+	....	....	....	....	+	+	....	+	....	....	....
47	....	....	+	....	....	....	....	+	+	+	....	....	....	....
48	....	....	+	....	....	....	....	+	+	+	+	....	....	....

While apparently there were seven organisms corresponding to No. 36 of Bergey and Deehan, on further analysis one organism does not ferment salicin and raffinos but does ferment potato starch and rhamnos. One organism does not ferment salicin nor potato starch but does ferment rhamnos and raffinos. One organism ferments salicin and rhamnos but does not ferment potato starch or raffinos. One organism ferments salicin but does not ferment rhamnos or raffinos. (These organisms not inoculated in potato starch.) One organism does not ferment salicin but potato starch, rhamnos, and raffinos. Two organisms were not inoculated in potato starch but one ferments salicin and the other does not. Both ferment rhamnos but not raffinos. This shows seven possible different organisms instead of the original one. According to the Bergey and Deehan classification two organisms corresponding to No. 42 were found but one of them fermented salicin and the other did not ferment salicin so these organisms evidently were not identical.

There were five organisms which correspond to No. 44. Of these, two ferment salicin and rhamnos but did not ferment raffinos. Two fermented rhamnos and raffinos but did not ferment salicin and one fermented all three, proving the difference in identities.

The organisms previously reported corresponding to 50, 51, 52. In the work of the author organisms corresponding to 58 were found once, and 60 were found twice, both of which organisms are evidently identical because of their similar supplementary fermentative reactions.

The organisms previously reported correspond to No. 78. In the work of the author organisms corresponding to 74 and 76 were found once.

The organisms previously reported

GROUP IV.

No.	Name.	Saccharose.	Dulcit.	Adonit.	Inulin.	Per cent. of gas.	H/CO₂.	Gelatin.	V/P.	Indol.	Motility.	Milk.	Sewage.	MacConkey.
49	....	....	....	+	....	20	....	....	....	....	....	....	....	....
50	Bacillus icteroides	....	....	+	....	30	3/1	....	....	....	+	1	....	....
51	Bacterium acidi lactici	....	....	+	....	40	2/1	....	....	+	....	1	5	1
52	....	....	....	+	....	....	3/1	....	....	+	+	....	....	1
53	....	....	....	+	....	....	....	....	+	....	....	....	....	....
54	....	....	....	+	....	....	....	....	+	....	+	....	....	....
55	....	....	....	+	....	....	....	....	+	+	....	....	....	....
56	....	....	....	+	....	....	....	....	+	+	+	....	....	....
57	....	....	....	+	....	....	....	+	....	....	....	....	....	....
58	....	....	....	+	....	....	....	+	....	....	+	....	....	....
59	....	....	....	+	....	....	....	+	....	+	....	....	....	....
60	....	....	....	+	....	....	....	+	....	+	+	....	....	....
61	....	....	....	+	....	....	....	+	+	....	....	....	....	....
62	....	....	....	+	....	....	....	+	+	....	+	....	....	....
63	....	....	....	+	....	....	....	+	+	+	....	....	....	....
64	....	....	....	+	....	....	....	+	+	+	+	....	....	....

correspond to 83, 84, 86 and 88. In the work of the author organisms corresponding to 82 were found eight times, 84 five times, 86 five times, 90 six times, 92 eight times, 94 nine times and 96 seven times.

According to the Bergey and Deehan classification there were eight corresponding to No. 82. Of these, two did not ferment salicin but did ferment glycerin, rhamnos and raffinos. One did not ferment salicin nor gly-

GROUP V.

No.	Name.	Saccharose.	Dulcit.	Adonit.	Inulin.	Per cent. o' Gas	H/CO₂	Gelatin.	V/P.	Indol.	Motility.	Milk.	Sewage.	MacConkey.
65	....	....	....	....	+	....	....	....	....	....	....	....	....	....
66	....	....	....	....	+	....	....	....	....	....	+	....	....	....
67	....	....	....	....	+	....	....	....	....	+	....	....	....	....
68	....	....	....	....	+	....	....	....	....	+	+	....	....	....
69	....	....	....	....	+	....	....	....	+	....	....	....	....	....
70	....	....	....	....	+	....	....	....	+	....	+	....	....	....
71	....	....	....	....	+	....	....	....	+	+	....	....	....	....
72	....	....	....	....	+	....	....	....	+	+	+	....	....	....
73	....	....	....	....	+	....	....	+	....	....	....	....	....	....
74	....	....	....	....	+	....	....	+	....	....	+	....	....	....
75	....	....	....	....	+	....	....	+	....	+	....	....	....	....
76	....	....	....	....	+	....	....	+	....	+	+	....	....	....
77	....	....	....	....	+	....	....	+	+	....	....	....	....	....
78	Bacillus levans	....	....	....	+	69	1/2	+	+	....	+	....	....	1
79	....	....	....	....	+	....	....	+	+	+	....	....	....	....
80	....	....	....	....	+	....	....	+	+	+	+	....	....	....

cerin but did ferment rhamnos and raffinos. Two fermented salicin, glycerin, rhamnos and raffinos. Two others fermented salicin, glycerin, rhamnos, but not raffinos. One other did not ferment salicin nor raffinos but did ferment glycerin and rhamnos showing that there were at least five distinct organisms according to the finer classification.

According to the original classification there are five corresponding to No. 84. Of these one ferments salicin, rhamnos and raffinos but did not ferment glycerin. One ferments salicin and glycerin but does not ferment raffinos. Three ferment all four showing that there were three different organisms according to their own individual fermentations.

According to the original classification five correspond to No. 86. Of these one ferments salicin and raffinos but does not ferment glycerin nor rhamnos. Two others ferment salicin, rhamnos, and raffinos but did not ferment glycerin, and two fermented all four, consequently there must have been three different organisms which could be separated from each other.

According to the original classification there were six corresponding to No. 90. Of these three did not ferment salicin but did ferment glycerin, rhamnos and raffinos. One did not ferment salicin nor glycerin but did ferment rhamnos and raffinos. Two others fermented salicin, glycerin, rhamnos and raffinos. Two others fermented salicin, glycerin, rhamnos, but did not ferment raffinos.

According to the classification of Bergey and Deehan, eight organisms correspond to No. 92. Of these two fermented salicin, glycerin, rhamnos, but did not ferment raffinos. Three fermented salicin, rhamnos and raffinos but did not ferment glycerin. One fermented salicin, glycerin and

GROUP VI.

No.	Name.	Saccharose.	Dulcit.	Adonit.	Inulin.	Per cent. of gas.	H/CO_2.	Gelatin.	V/P.	Indol.	Motility.	Milk.	Sewage.	MacConkey.
81	....	+	+	....	....	....	....	....	....	....	....	....	....	....
82	....	+	+	....	....	....	....	....	....	....	+	....	....	....
83	Bacterium Neapolitanus	+	+	....	....	30	2/1	....	....	+	....	1	....	....
84	Bacillus coli communior	+	+	....	....	30	2/1	....	....	+	+	2	8	1
85	....	+	+	....	....	....	....	....	+	....	....	....	....	....
86	....	+	+	....	....	45	1/2	....	+	....	+	1	....	....
87	....	+	+	....	....	....	....	....	+	+	....	....	....	....
88	....	+	+	....	....	50	2/3	....	+	+	+	1	....	....
89	....	+	+	....	....	....	....	+	....	....	....	....	....	....
90	....	+	+	....	....	....	....	+	....	....	+	....	....	....
91	....	+	+	....	....	....	....	+	....	+	....	....	....	....
92	....	+	+	....	....	....	....	+	....	+	+	....	....	....
93	....	+	+	....	....	....	....	+	+	....	....	....	....	....
94	....	+	+	....	....	....	....	+	+	....	+	....	....	....
95	....	+	+	....	....	....	....	+	+	+	....	....	....	....
96	....	+	+	....	....	....	....	+	+	+	+	....	....	....

raffinos but did not ferment rhamnos. One fermented glycerin, rhamnos, raffinos, but did not ferment salicin and one fermented all four showing that there were at least five different organisms on finer analysis.

According to the above classification of Bergey and Deehan, nine organisms were found corresponding to No. 94. Of these, one ferments salicin, glycerin, rhamnos. One ferments salicin, rhamnos, raffinos, but does not ferment glycerin. One ferments salicin and rhamnos but not glycerin and raffinos and three ferments salicin, glycerin, raffinos and rhamnos. Two did not ferment salicin but fermented glycerin, rhamnos and raffinos. One did not ferment salicin nor rhamnos but fermented glycerin and raffinos, thus showing that instead of one organism there were really seven different organisms corresponding to this number.

Of the seven organisms corresponding to No. 96, one ferments salicin, glycerin and raffinos, but did not ferment rhamnos. One ferments salicin, rhamnos and raffinos but did not ferment glycerin. Five ferment salicin, glycerin, rhamnos and raffinos, thus showing that there were three distinct organisms corresponding to No. 96 of the original classification.

The organisms previously reported corresponding to 97, 99, 101 and 103. In the work of the author 110 was found once.

The organisms previously reported correspond to 116. In the work of the author 124 was found once.

The organisms previously reported correspond to No. 132. In the work of the author No. 132 was found three times, 136 was found once, 140 was found three times, 142 was found once, 144 was found three times.

According to the original classification three organisms corresponding to No. 132 were found. Of these, one ferments salicin, glycerin, but did not

GROUP VII.

No.	Name.	Saccharose.	Dulcit.	Adonit.	Inulin.	Per cent. of gas.	H/CO_2	Gelatin.	V/P	Indol.	Motility.	Milk.	Sewage.	MacConkey.
97	....	+	....	+	....	50	2/1	....	....	....	....	....	....	2
98	....	+	....	+	....	....	....	....	....	....	+	....	....	....
99	....	+	....	+	....	30	3/1	....	....	+	....	4	....	....
100	....	+	....	+	....	....	....	....	....	+	+	....	....	....
101	....	+	....	+	....	90	2/3	....	+	....	....	....	....	1
102	....	+	....	+	....	....	....	....	+	....	+	....	....	....
103	Bacterium aerogenes	+	....	+	....	50	2/1	....	+	+	....	3	6	....
104	....	+	....	+	....	....	....	....	+	+	+	....	....	....
105	....	+	....	+	....	....	....	+	....	....	....	....	....	....
106	....	+	....	+	....	....	....	+	....	....	+	....	....	....
107	....	+	....	+	....	....	....	+	....	+	....	....	....	....
108	....	+	....	+	....	....	....	+	....	+	+	....	....	....
109	....	+	....	+	....	....	....	+	+	....	....	....	....	....
110	....	+	....	+	....	....	....	+	+	....	+	....	....	....
111	....	+	....	+	....	....	....	+	+	+	....	....	....	....
112	....	+	....	+	....	....	....	+	+	+	+	....	....	....

GROUP VIII.

No.	Name.	Saccharose.	Dulcit.	Adonit.	Inulin.	Per cent. of gas.	H/CO_2.	Gelatin.	V/P.	Indol.	Motility.	Milk.	Sewage.	MacConkey.
113	....	+	....	....	+	....	....	....	....	....	....	....	....	....
114	....	+	....	....	+	....	....	....	....	....	+	....	....	....
115	....	+	....	....	+	....	....	....	....	+	....	....	....	....
116	....	+	....	....	+	30	4/1	....	....	+	+	1	....	....
117	....	+	....	....	+	....	....	....	+	....	....	....	....	....
118	....	+	....	....	+	....	....	....	+	....	+	....	....	....
119	....	+	....	....	+	....	....	....	+	+	....	....	....	....
120	....	+	....	....	+	....	....	....	+	+	+	....	....	....
121	....	+	....	....	+	....	....	+	....	....	....	....	....	....
122	....	+	....	....	+	....	....	+	....	....	+	....	....	....
123	....	+	....	....	+	....	....	+	....	+	....	....	....	....
124	....	+	....	....	+	....	....	+	....	+	+	....	....	....
125	....	+	....	....	+	....	....	+	+	....	....	....	....	....
126	....	+	....	....	+	....	....	+	+	....	+	....	....	....
127	....	+	....	....	+	....	....	+	+	+	....	....	....	....
128	....	+	....	....	+	....	....	+	+	+	+	....	....	....

GROUP IX.

No.	Name.	Saccharose.	Dulcit.	Adonit.	Inulin.	Per cent. of Gas	H/CO_2	Gelatin.	V/P.	Indol.	Motility.	Milk.	Sewage.	MacConkey.
129	....	....	+	+	....	....	....	....	....	....	....	....	....	....
130	....	....	+	+	....	....	....	....	....	....	+	....	....	....
131	....	....	+	+	....	....	....	....	....	+	....	....	....	....
132	....	....	+	+	....	25	2/1	....	....	+	+	....	1	....
133	....	....	+	+	....	....	....	....	+	....	....	....	....	....
134	....	....	+	+	....	....	....	....	+	....	+	....	....	....
135	....	....	+	+	....	....	....	....	+	+	....	....	....	....
136	....	....	+	+	....	....	....	....	+	+	+	....	....	....
137	....	....	+	+	....	....	....	+	....	....	....	....	....	....
138	....	....	+	+	....	....	....	+	....	....	+	....	....	....
139	....	....	+	+	....	....	....	+	....	+	....	....	....	....
140	....	....	+	+	....	....	....	+	....	+	+	....	....	....
141	....	....	+	+	....	....	....	+	+	....	....	....	....	....
142	....	....	+	+	....	....	....	+	+	....	+	....	....	....
143	....	....	+	+	....	....	....	+	+	+	....	....	....	....
144	....	....	+	+	....	....	....	+	+	+	+	....	....	....

ferment rhamnos nor raffinos and two did not ferment salicin but did ferment glycerin, raffinos and rhamnos showing that there were at least two distinct organisms corresponding to No. 132.

According to the original classification three corresponding to No. 140 were found. Of these, two did not ferment salicin but did ferment glycerin, rhamnos and raffinos and one fermented salicin and rhamnos but did not ferment glycerin and raffinos, showing that there were at least two distinct organisms.

According to the original classification three corresponding to No. 144 were found, all of which fermented salicin, glycerin, rhamnos and raffinos, showing them to be identical.

No organisms of Group X were found by the author.

No organisms of Group XI were found by the author.

GROUP X.

No.	Name.	Saccharose.	Dulcit.	Adonit.	Inulin.	Per cent. of gas.	H/CO$_2$.	Gelatin.	V/P.	Indol.	Motility.	Milk.	Sewage.	MacConkey.
145	....	....	+	....	+	....	....	....	....	....	....	....	....	....
146	....	....	+	....	+	....	....	....	....	....	+	....	....	....
147	....	....	+	....	+	....	....	....	....	+	....	....	....	....
148	....	....	+	....	+	....	....	....	....	+	+	....	....	....
149	....	....	+	....	+	....	....	....	+	....	....	....	....	....
150	....	....	+	....	+	....	....	....	+	....	+	....	....	....
151	....	....	+	....	+	....	....	....	+	+	....	....	....	....
152	....	....	+	....	+	....	....	....	+	+	+	....	....	....
153	....	....	+	....	+	....	....	+	....	....	....	....	....	....
154	....	....	+	....	+	....	....	+	....	....	+	....	....	....
155	....	....	+	....	+	....	....	+	....	+	....	....	....	....
156	....	....	+	....	+	....	....	+	....	+	+	....	....	....
157	....	....	+	....	+	....	....	+	+	....	....	....	....	....
158	....	....	+	....	+	....	....	+	+	....	+	....	....	....
159	....	....	+	....	+	....	....	+	+	+	....	....	....	....
160	....	....	+	....	+	....	....	+	+	+	+	....	....	....

GROUP XI.

No.	Name.	Saccharose.	Dulcit.	Adonit.	Inulin.	Per cent. of gas.	H/CO$_2$	Gelatin.	V/P	Indol.	Motility.	Milk.	Sewage.	MacConkey.
161	....	....	....	+	+	....	....	....	....	....	....	....	....	....
162	....	....	....	+	+	....	....	....	....	....	+	....	....	....
163	....	....	....	+	+	....	....	....	....	+	....	....	....	....
164	....	....	....	+	+	....	....	....	....	+	+	....	....	....
165	....	....	....	+	+	....	....	....	+	....	....	....	....	....
166	....	....	....	+	+	....	....	....	+	....	+	....	....	....
167	....	....	....	+	+	....	....	....	+	+	....	....	....	....
168	....	....	....	+	+	....	....	....	+	+	+	....	....	....
169	....	....	....	+	+	....	....	+	....	....	....	....	....	....
170	....	....	....	+	+	....	....	+	....	....	+	....	....	....
171	....	....	....	+	+	....	....	+	....	+	....	....	....	....
172	....	....	....	+	+	....	....	+	....	+	+	....	....	....
173	....	....	....	+	+	....	....	+	+	....	....	....	....	....
174	....	....	....	+	+	....	....	+	+	....	+	....	....	....
175	....	....	....	+	+	....	....	+	+	+	....	....	....	....
176	....	....	....	+	+	....	....	+	+	+	+	....	....	....

GROUP XII.

No.	Name.	Saccharose.	Dulcit.	Adonit.	Inulin.	Per cent. of gas.	H/CO$_2$.	Gelatin.	V/P.	Indol.	Motility.	Milk.	Sewage.	MacConkey.
177	....	+	+	+	....	80	1/2	....	....	....	...	2	....	....
178	....	+	+	+	....	....	....	....	....	....	+	....	....	....
179	Bacterium pneumonicum	+	+	+	....	30	3/1	....	....	+	....	....	....	....
180	....	+	+	+	....	40	3/1	....	....	+	+	....	....	1
181	....	+	+	+	....	75	3/2	....	+	....	....	....	....	1
182	....	+	+	+	....	....	....	....	+	....	+	....	....	....
183	....	+	+	+	....	20	1/2	....	+	+	....	1	....	....
184	....	+	+	+	....	....	....	....	+	+	+	....	....	....
185	....	+	+	+	....	....	....	+	....	....	....	....	....	....
186	....	+	+	+	....	....	....	+	....	....	+	....	....	....
187	....	+	+	+	....	....	....	+	....	+	....	....	....	....
188	....	+	+	+	....	....	....	+	....	+	+	....	....	....
189	....	+	+	+	....	....	....	+	+	....	....	....	....	....
190	....	+	+	+	....	....	....	+	+	....	+	....	....	....
191	....	+	+	+	....	....	....	+	+	+	....	....	....	....
192	....	+	+	+	....	....	....	+	+	+	+	....	....	....

The organisms previously reported correspond to 177, 179, 180, 181 and 183. In the work of the author No. 180 was found nine times, 182 was found six times, 184 was found six times, 186 was found seven times, 188 was found nine times, 190 was found three times, 192 was found fourteen times.

According to the original classification nine organisms corresponding to No. 180 were found. Of these, one ferments salicin, glycerin and raffinos but did not ferment rhamnos. Two did not ferment salicin but fermented glycerin, rhamnos and raffinos. Six fermented salicin, glycerin, rhamnos and raffinos showing that there were at least three distinct organisms corresponding to No. 180.

Of the six organisms found corresponding to No. 182 of the original classification, one ferments salicin, glycerin and raffinos but does not ferment rhamnos and five ferment salicin, glycerin, rhamnos and raffinos, showing that there are at least two different organisms which might be classified as No. 182 of the Bergey and Deehan class.

Of the six found corresponding to No. 184 of the original classification, one does not ferment salicin but does ferment glycerin, rhamnos, raffinos and levulose (potato starch not used). One ferments salicin, glycerin, rhamnos, raffinos, potato starch, but does not ferment levulose. One ferments salicin, glycerin, rhamnos, raffinos and levulose but does not ferment potato starch and three ferment salicin, glycerin, rhamnos, raffinos, levulose (potato starch not used), showing that there are at least three different organisms which are classified by Bergey and Deehan as No. 184.

Of the seven which correspond to No. 186 of the original classification, one ferments salicin, rhamnos, raffinos, but does not ferment glycerin (corn starch and potato starch not used). One ferments salicin, glycerin, rhamnos but does not ferment raffinos, corn starch nor potato starch. One ferments salicin, glycerin, rhamnos and raffinos and potato starch (corn starch not used). One ferments salicin, glycerin, raffinos and rhamnos but does not ferment corn starch nor potato starch. Two ferment salicin, glycerin, rhamnos and raffinos and corn starch but do not ferment potato starch and one ferments salicin, glycerin, rhamnos and raffinos, corn starch and potato starch, showing that there were at least five and possibly six different organisms corresponding to the original No. 186.

Of the nine which correspond to the original No. 188, one ferments salicin, glycerin, rhamnos and raffinos (potato starch and corn starch not used). One ferments salicin, glycerin, rhamnos, raffinos, corn starch, but does not ferment potato starch and two ferment salicin, glycerin, rhamnos and raffinos but does not ferment corn starch nor potato starch. One does not ferment salicin, but ferments glycerin, rhamnos and raffinos (potato starch and corn starch not used). Four do not ferment salicin nor potato starch nor corn starch but do ferment glycerin, raffinos and rhamnos, showing that there were at least three and possibly five different organisms corresponding to the original No. 188.

Of the three organisms corresponding to No. 190, one ferments salicin, glycerin, rhamnos, raffinos and potato starch but does not ferment corn starch. One ferments salicin, glycerin, raffinos and potato starch but does not ferment rhamnos nor corn starch and one ferments glycerin, rhamnos and raffinos but does not ferment salicin nor potato starch nor corn starch, showing that there were three distinct organisms corresponding to the original No. 190.

Of the fourteen organisms corresponding to No. 192 of the original classification, seven ferment salicin, glycerin, raffinos, rhamnos, but do not ferment corn starch nor potato starch. One ferments salicin, glycerin, rhamnos, raffinos and corn starch (potato starch not used). One ferments salicin, glycerin, rhamnos and raffinos and potato starch but does not ferment corn starch. Three do not ferment salicin nor corn starch but did ferment glycerin, rhamnos, raffinos and potato starch. One does not ferment salicin, corn starch nor potato starch but does ferment glycerin, rhamnos and raffinos and one ferments salicin, glycerin, rhamnos, raffinos, corn starch and potato starch showing that there were at least six distinct organisms corresponding to the original No. 192.

The organisms previously reported correspond to 197 and 198. In the work of the author No. 194 was found twice, 196 was found once, 200 was found twice, 202 was found twice, 204 was found six times, 206 was found once, 208 was found three times.

Of the two organisms which correspond to the original No. 194, both are apparently the same organism.

Of the two organisms corresponding to No. 200 of the original classification

GROUP XIII.

No.	Name.	Saccharose.	Dulcit.	Adonit.	Inulin.	Per cent. of Gas	H/CO$_2$	Gelatin.	V/P.	Indol.	Motility.	Milk.	Sewage.	MacConkey.
193	....	+	+	....	+	....	....	....	....	....	....	....	....	....
194	....	+	+	....	+	....	....	....	....	....	+	....	....	....
195	....	+	+	....	+	....	....	....	....	+	....	....	....	....
196	....	+	+	....	+	....	....	....	....	+	+	....	....	....
197	....	+	+	....	+	50	1/1	....	+	....	....	....	1	....
198	....	+	+	....	+	50	2/1	....	+	....	+	1	....	....
199	....	+	+	....	+	....	....	....	+	+	....	....	....	....
200	....	+	+	....	+	....	....	....	+	+	+	....	....	....
201	....	+	+	....	+	....	....	+	....	....	....	....	....	....
202	....	+	+	....	+	....	....	+	....	....	+	....	....	....
203	....	+	+	....	+	....	....	+	....	+	....	....	....	....
204	....	+	+	....	+	....	....	+	....	+	+	....	....	....
205	....	+	+	....	+	....	....	+	+	....	....	....	....	....
206	....	+	+	....	+	....	....	+	+	....	+	....	....	....
207	....	+	+	....	+	....	....	+	+	+	....	....	....	....
208	....	+	+	....	+	....	....	+	+	+	+	....	....	....

one ferments salicin, glycerin, rhamnos and raffinos and the other does not ferment salicin and ferments glycerin, rhamnos and raffinos, showing that these are two distinct organisms. Of the two organisms which correspond to the original No. 202, one ferments salicin, glycerin, rhamnos, and corn starch but does not ferment raffinos nor potato starch. The other ferments salicin, glycerin, rhamnos, raffinos, but does not ferment corn starch (potato starch not used), showing that there are two distinct organisms corresponding to this original.

Of the five organisms corresponding to the original No. 204, one ferments salicin, glycerin, rhamnos and raffinos but does not ferment corn starch nor potato starch. One does not ferment salicin nor raffinos, nor corn starch nor potato starch but does ferment glycerin and rhamnos. Two do not ferment salicin nor corn starch nor potato starch but do ferment glycerin, rhamnos and raffinos and one ferments salicin, glycerin, rhamnos and raffinos and both corn starch and potato starch, showing that at least the original No. 204 comprises at least four distinct organisms.

Of the two cultures which correspond to the original No. 208, both ferment salicin, glycerin, rhamnos and raffinos, but one ferments dextrose and the other does not ferment dextrose showing the distinct difference.

The organisms previously reported correspond to 211, 213, 215. In the work of the author organisms corresponding to No. 224 were found once.

No organisms of this group were found by the author.

The organisms previously reported correspond to 245, 247, and 248. In the work of the author organisms corresponding to No. 242 were found once, 244 five times, 246 three times, 248 five times, 250 three times, 252 five

GROUP XIV.

No.	Name.	Saccharose.	Dulcit.	Adonit.	Inulin.	Per cent. of gas.	H/CO$_2$.	Gelatin.	V/P.	Indol.	Motility.	Milk.	Sewage.	MacConkey.
209	....	+	....	+	+	....	......	....	....	....	....	....	....	....
210	....	+	....	+	+	....	....	....	....	....	+	....	....	....
211	....	+	....	+	+	75	2/1	....	....	+	....	2	....	....
212	....	+	....	+	+	....	....	....	....	+	+	....	....	....
213	....	+	....	+	+	30	2/1	....	+	....	....	1	....	1
214	....	+	....	+	+	....	....	....	+	....	+	....	....	....
215	....	+	....	+	+	....	1/1	....	+	+	....	2	....	1
216	....	+	....	+	+	....	....	....	+	+	+	....	....	....
217	....	+	....	+	+	....	....	+	....	....	....	....	....	....
218	....	+	....	+	+	....	....	+	....	....	+	....	....	....
219	....	+	....	+	+	....	....	+	....	+	....	....	....	....
220	....	+	....	+	+	....	....	+	....	+	+	....	....	....
221	....	+	....	+	+	....	....	+	+	....	....	....	....	....
222	....	+	....	+	+	....	....	+	+	....	+	....	....	....
223	....	+	....	+	+	....	....	+	+	+	....	....	....	....
224	....	+	....	+	+	....	....	+	+	+	+	....	....	....

GROUP XV.

No.	Name.	Saccharose.	Dulcit.	Adonit.	Inulin.	Per cent. of gas.	H/CO$_2$	Gelatin.	V/P	Indol.	Motility.	Milk.	Sewage.	MacConkey.
225	....	....	+	+	+	....	....	....	....	....	....	....	....	....
226	....	....	+	+	+	....	....	....	....	....	+	....	....	....
227	....	....	+	+	+	....	....	....	....	+	....	....	....	....
228	....	....	+	+	+	....	....	....	....	+	+	....	....	....
229	....	....	+	+	+	....	....	....	+	....	....	....	....	....
230	....	....	+	+	+	....	....	....	+	....	+	....	....	....
231	....	....	+	+	+	....	....	....	+	+	....	....	....	....
232	....	....	+	+	+	....	....	....	+	+	+	....	....	....
233	....	....	+	+	+	....	....	+	....	....	....	....	....	....
234	....	....	+	+	+	....	....	+	....	....	+	....	....	....
235	....	....	+	+	+	....	....	+	....	....	....	....	....	....
236	....	....	+	+	+	....	....	+	....	+	+	....	....	....
237	....	....	+	+	+	....	....	+	+	....	....	....	....	....
238	....	....	+	+	+	....	....	+	+	....	+	....	....	....
239	....	....	+	+	+	....	....	+	+	+	....	....	....	....
240	....	....	+	+	+	....	....	+	+	+	+	....	....	....

times, 254 eight times, 256 eighteen times.

Of the five organisms corresponding to the original No. 244, one ferments salicin, glycerin, rhamnos, raffinos and potato starch but does not ferment corn starch. Three ferment salicin, glycerin, rhamnos, raffinos, but do not ferment corn starch and potato starch. One does not ferment salicin, nor corn starch but ferments glycerin, rhamnos, raffinos and potato

GROUP XVI.

No.	Name.	Saccharose.	Dulcit.	Adonit.	Inulin.	Per cent. of gas.	H/CO_2.	Gelatin.	V/P.	Indol.	Motility.	Milk.	Sewage.	MacConkey.
241	....	+	+	+	+	....	....	....	....	....	....	....	....	....
242	....	+	+	+	+	....	....	....	....	....	+	....	....	....
243	....	+	+	+	+	....	....	....	....	+	....	....	....	....
244	....	+	+	+	+	....	....	....	....	+	+	....	....	....
245	Bacterium oxytocum	+	+	+	+	60	1/1	....	+	....	....	....	8	1
246	....	+	+	+	+	....	....	....	+	....	+	....	....	....
247	...	+	+	+	+	90	1/1	....	+	+	....	1	....	4
248	...	+	+	+	+	50	3/2	...	+	+	+	1	....	....
249	...	+	+	+	+	....	....	+	....	....	....	....	....	....
250	....	+	+	+	+	....	....	+	....	....	+	....	....	....
251	....	+	+	+	+	....	....	+	....	+	....	....	....	....
252	....	+	+	+	+	....	....	+	....	+	+	....	....	....
253	....	+	+	+	+	....	....	+	+	....	....	....	....	....
254	....	+	+	+	+	....	....	+	+	....	+	....	....	....
255	....	+	+	+	+	....	....	+	+	+	....	....	....	....
256	....	+	+	+	+	....	....	+	+	+	+	....	....	....

starch, showing that there are at least three distinct organisms under the No. 244.

Of the three organisms which are classified as the original No. 246, two ferment salicin, glycerin, rhamnos and raffinos but do not ferment corn starch. One ferments all of these substances, showing that there are at least two distinct organisms under the original No. 246.

Of the five organisms of the original No. 248, one ferments salicin, glycerin, rhamnos, raffinos (corn starch not used). One ferments salicin, glycerin, raffinos, but does not ferment rhamnos nor corn starch. Two ferment salicin, glycerin, rhamnos, raffinos, but do not ferment corn starch nor potato starch. One ferments glycerin, rhamnos, and raffinos but does not ferment salicin nor corn starch nor potato starch, showing that there are at least four distinct organisms corresponding to the original No. 248.

Of the three organisms corresponding to No. 250, one ferments salicin, glycerin, rhamnos and raffinos but does not ferment corn starch nor potato starch. One ferments salicin, glycerin, rhamnos and raffinos but does not ferment corn starch (potato starch not used). One ferments all of these substances, showing that there are at least two and possibly three distinct organisms under the original No. 250.

Of the five corresponding to the original No. 252, one ferments salicin, glycerin and raffinos but does not ferment rhamnos nor corn starch (potato starch not used). One ferments salicin, glycerin, rhamnos and raffinos but does not ferment corn starch nor potato starch. One ferments glycerin and raffinos but does not ferment salicin, rhamnos nor corn starch nor potato starch. Two ferment glycerin, rhamnos, raffinos and potato starch but does not ferment salicin nor corn starch, showing that there are at least four distinct organisms which might be classified in the original No. 252.

Of the eight organisms of the original classification No. 254, two ferments salicin, glycerin, rhamnos and raffinos (corn starch and potato starch not used). Four ferment salicin, glycerin, rhamnos, raffinos and potato starch but do not ferment corn starch. One ferments glycerin, rhamnos, raffinos and potato starch but does not ferment salicin and corn starch. One ferments rhamnos and raffinos but does not ferment salicin, glycerin, corn starch and potato starch, showing that there are at least four distinct organisms which might be classified in No. 254.

Of the eighteen organisms of the original classification No. 256, five ferment salicin, glycerin, rhamnos and raffinos (corn starch and potato starch not used). One ferments salicin, glycerin, raffinos and potato starch but does not ferment rhamnos nor corn starch. One ferments salicin, glycerin, rhamnos and raffinos and corn starch but does not ferment potato starch. One ferments salicin, glycerin, rhamnos, raffinos but does not ferment corn starch (potato starch not used). One ferments salicin, glycerin, rhamnos, and raffinos but does not ferment corn starch nor potato starch. One ferments salicin, glycerin, rhamnos, raffinos and potato starch but does not ferment corn starch. Two ferment all of these substances. One does not ferment salicin but ferments glycerin, rhamnos, raffinos, corn starch and potato starch. One does not ferment salicin, rhamnos nor corn starch but ferments glycerin, raffinos and potato starch. Two do not ferment salicin, corn starch nor potato starch but ferments glycerin, rhamnos and raffinos, thus showing that there are at least one, two, three, four, five, six, seven, eight and possibly nine, ten or eleven different varieties which might be classified under the original No. 256.

SUMMARY.

From the above it stands out very distinctly that by the use of rhamnos and raffinos, salicin and glycerin, corn starch and potato starch many organisms may be separated which according to the Bergey and Deehan classification might be identical. For instance all those organisms which fall in Group V, Group VIII, Group X, Group XI, Group XIII, XIV, XV, Group XVI, ferment inulin, yet when the above organisms are examined there are many instances found where the fermentation of corn starch or potato starch or both may differ from those of inulin. The exact opposite is true, namely, that in those groups where inulin is not fermented some of the organisms ferments either corn starch or potato starch or both. Other authors have used salicin, glycerin, rhamnos, raffinos but the author wants to take this occasion to emphasize their usefulness as the means of identifying individual organisms.

Kligler in his work (*Journal of Infectious Diseases*, July, 1914) used salicin and glycerin as the basis of his isolation and sub-division, but his classification has this disadvantage and the author wants to take this occasion to point it out, viz.: that salicin and glycerin are fermented very slowly and for quick work necessary for the isolation of at least the group or sub-group of B. coli, these substances can not be used. For instance it frequently happens that the author found salicin or glycerin would not be fermented in four days when the original checking was made but at the end of thirty days either one or the other might be fermented. It was frequently found that either glycerin or salicin under those conditions was fermented. If, on the other hand, time is not to be considered, then salicin and glycerin become quite essential in the ultimate analysis of the sub-groups of B. coli.

IN CONCLUSION.

Members of the Colon group were found in milk taken from various sources and when the media mentioned above were used, organisms were found according to the Bergey and Deehan classification, which up to that time had not been described. The Bergey and Deehan classification is apparently a very good working basis but it must be enlarged in order to bring out organisms which have not as yet been described. Another conclusion to be brought out from this work is certain sugars, levulose, maltose, galactos, xylos, mannos and arabinos are valueless as far as differentiating the members of the sub-group; however, they are useful in showing fermentation by members of this group of organisms.

NOTE.—In working out the above problems it became very apparent that the ratio of hydrogen and carbon-dioxide had a definite relation of the negative or positive Vokes-Proskaur reaction. If the Vokes-Proskaur was positive the hydrogen-carbon-dioxide ratio was either one to one or the carbon dioxide was greater than that of hydrogen. If the reaction was negative the reverse was always true. Further work on this ratio is now being carried out in this laboratory.

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TUBERCULOSIS DEATH-RATE DECREASES IN CALIFORNIA.

For many years California has had one of the highest, if not the very highest, tuberculosis death-rate of any state in the Union, with the possible exception of some southern states having high colored populations. Dr. W. A. Sawyer, Secretary of the California State Board of Health, says that the tremendous drop in the California death-rate for this disease during 1916, however, gives hope that California may soon loose this unenviable record. The tuberculosis death-rate in California dropped from 194.5 per hundred thousand population in 1916 to 178.5 per hundred thousand population in 1916. This means that there were 5,254 deaths in 1916, against 5,551 such deaths in 1915.

REPORT OF COMMITTEE ON SANITARY CONTROL OF WATERWAYS.

Read before the Sanitary Engineering Section of the American Public Health Association, Cincinnati, Ohio, October 26, 1916.

THE Committee on Sanitary Control of Waterways presents this report summarizing certain principles relating to the sanitary control of waterways and embodying a code of regulations for such control.

History of Committee's Work. Since the establishment of a Committee on Sanitary Control of Waterways, the committee's activities have been conducted along two lines, namely:

1. Gathering information on the subject of waterway sanitation.
2. Preparing statement of current acceptable practice in dealing with problems of waterway pollution.

During 1913 and 1914 the committee devoted its attention largely to gathering information. As a result of the committee's efforts several members of the section presented papers discussing the status of the control of waterway sanitation in various parts of the United States. Some of these papers, presented at the annual convention in 1914, appear in Vol. 4, 1914, pages 819 to 884, inclusive, of the AMERICAN JOURNAL OF PUBLIC HEALTH.

In 1913 the committee prepared a report setting forth what was then regarded as acceptable practice, and pointed out the lines along which further development and further knowledge might be expected. This report appears in Vol. 4, 1914, pages 934 to 938, of the AMERICAN JOURNAL OF PUBLIC HEALTH.

In 1915 a tentative preliminary report of the same nature was presented informally by the chairman of the committee, the report being retained, however, in the hands of the committee.

Object of Report. At the present time the committee believes that the condition of the art of sewage and industrial wastes treatment and the consensus of opinion about waterways sanitation, warrant it in again presenting a report on acceptable practice. This report, however, is not to be regarded as final, but merely as an endeavor to state principles and practice in the light of present knowledge. It is to be expected that this report will be superseded by others in the future.

This section, of course, has no governmental authority to formulate rules or standards, nor to enforce its conclusions. Nevertheless, it may deal with the question in a broad way and, recognizing certain principles and practices, adopt general regulations which may serve as a basis for similar rulings to be promulgated by official boards.

An effort has been made in formulating this report, to present fundamental considerations in a way that may be readily understood by the layman, that it may assist in crystallizing public opinion as to what is necessary or adequate for preserving the cleanliness of waterways. A discussion of technical methods and devices used by experts, in studying the effect of polluting matter upon waterways, while of the greatest importance, may be considered more advantageously by other committees and by other sections.

Certain principles recognized as underlying the proper solution of waterway pollution problems, are first presented, following which is a code of regulations which may be said to be an expression of the present consensus of opinion.

FUNDAMENTAL PRINCIPLES GOVERNING THE SANITARY CONTROL OF WATERWAYS.

1. Generally speaking, there are three distinctive, important and somewhat independent characteristics of sewage and other waste polluting matters which are primarily the cause of the objectionable condition of our streams; grosser suspended matters largely of an organic nature, which may give rise to objectionable deposits; organic matter in a finely divided or soluble state which under certain conditions may give rise to putrefactive odors; and pathogenic bacteria which may cause disease. The first two of these are closely identified with the creation of conditions which may be objectionable from an esthetic point of view, and the latter of conditions affecting health.

2. With present knowledge of the various artificial processes of sewage treatment and of water purification, it is possible theoretically, though not always practicable, by either or both of these processes to carry purification to almost any desired degree.

3. Owing to the natural supply of dissolved oxygen generally carried by surface water and its capacity to oxidize or assimilate organic matter present, and to the dispersion and dilution that generally occurs when sewage and wastes are properly discharged into running streams and other bodies of water, the discharge of sewage and wastes into such waters must be accepted as a natural and, under proper restrictions, a suitable method of disposal. Such restrictions apply to the quantity and quality of water available for dilution, the physical character of the bed and banks or shores of the body of water, the quantity and character of the polluting matter being or to be disposed of, the uses of the waterway for water supply, ice supply, recreation purposes including bathing, and food supply.

4. The method of disposal, termed "dilution," constitutes a valuable sanitary and economic resource or asset to communities and industrial establishments situated upon or along waterways adapted to this use, and each party is entitled to its proportional and justifiable share in this natural resource.

5. With the natural growth of population and industries throughout the country, it is impracticable to maintain our streams in their original state of purity, and all municipalities taking water supplies from waters flowing off from populated drainage areas must for the proper protection of public health provide themselves with water purification plants irrespective of the methods employed for sewage disposal.

6. The requirements and share of responsibilities to be met by various municipalities, corporations and persons in regard to treatment of sewage and other wastes, purification of water and the use of bodies of water, involve not only sanitary but economic and legal considerations the jurisdiction and administration of which should be left to the proper authorities.

CODE OF REGULATIONS FOR THE SANITARY CONTROL OF WATERWAYS.

With this brief statement of certain fundamental principles which have a direct and important bearing upon this subject, the following code of regulations for the sanitary control of waterways, is presented for adoption by the section:

I. There shall be no objectionable deposits at any point in a waterway as a result of sewage or other wastes discharged therein.

Note: To prevent such deposits public authorities should recognize the efficacy of such preventive and corrective measures as the dredging and removing of the deposits before they become objectionable, the proper location of sewer outlets and the removal of solids by screening, sedimentation, chemical precipitation and like methods.

II. There shall be no local nuisance created at or in the vicinity of any sewage or industrial wastes outfall, arising from excessive turbidity or the production of odors.

Note: To prevent such conditions public authorities should recognize the efficacy of such preventive and corrective measures as the arrangement and proper protection of sewage outlets and all methods of sewage treatment in properly designed plants, including screening, sedimentation, chemical precipitation, oxidation in various types of coarse and fine-grained filters and treatment by the activated sludge process.

III. There shall be no general nuisance created in a waterway due to excessive turbidity or to odors, as a result of sewage or other wastes discharged therein.

Note: To prevent such conditions public authorities should recognize the efficacy of such methods of sewage treatment as are enumerated in Article II, but it will be necessary to carry the treatment far enough to meet the following requirements:

1. That dissolved oxygen shall be present in the waters of the waterway at all points and at all times in such quantities as to prevent the emanation of putrefactive odors.

2. That every municipality or industrial establishment discharging sewage or wastes into a waterway may have its proper share of the dissolved oxygen, subject to the aforesaid limitation of paragraph 1.

3. That the share of dissolved oxygen of a waterway, which a municipality or industrial establishment may utilize at any time, should be subject only to the aforesaid limitation (stated in paragraph 1), so long as other parties are not utilizing it nor thereby being deprived of its use.

4. That as the size and number of municipalities or industrial establishments discharging sewage or wastes into the waterway, increases, and the available share of dissolved oxygen for each decreases, treatment methods must be increased generally and correspondingly, in order that each party may continue to have the share of the available oxygen to which it is entitled.

IV. There shall be no interference with or undue burden upon mechanical operation or bacterial efficiency of water purification plants procuring their raw water from a waterway.

Note: The public authorities should recognize in this case:

1. The efficacy of re-locating water supply intakes and sewer outlets as a means of remedy.

2. The efficacy of such methods of sewage

treatment as will reduce the quantity or alter the character of either that suspended matter or that dissolved matter, or both, which may interfere directly or indirectly with the mechanical efficiency and operation of water purification plants.

3. The efficacy of such methods of treatment as will reduce the number of bacteria which may cause a bacterial burden upon water purification plants.

4. That since water or sewage purification processes can be carried to any desired limit, at least theoretically, the share of responsibility which is to be imposed upon the different sewage disposal and water purification plants, with respect to extent of purification, will obviously depend upon a number of legal and administrative considerations of an economic, engineering and public health nature which properly come within the jurisdiction of central authorities and the courts.

V. There shall be no active (potentially dangerous) bacterial contamination or gross pollution of properly located and authorized shellfish beds.

Note: Public authorities should recognize in this matter five important features:

1. The proper supervision, by competent authority, of the location of shellfish beds and drinking places, and suitable control of shellfish operation.

2. That the gross pollution of shellfish beds by deposits of suspended matter from sewage or industrial wastes can be prevented, and that bacterial contamination of the beds may be avoided, by relocation of sewer outlets.

3. That the gross pollution of shellfish beds by deposits of suspended matter from sewage or industrial wastes, can be prevented also by the installation of proper sewage treatment processes which will remove these solids to the extent necessary.

4. That where shellfish beds are so located as not to be subject to gross pollution and where bacterial protection only will be necessary, this protection can be accomplished satisfactorily by the employment of such methods of treatment as will destroy or remove the bacteria.

5. That since active bacterial contamination and gross pollution of shellfish beds can be prevented by proper location of such beds and by proper location of sewer outfalls and proper treatment of sewage and other wastes, the enforcement of the abandonment or re-location of shellfish beds or of preventive or remedial measures to protect such beds will obviously depend upon a number of legal and administrative considerations of an economic, engineering and public health nature which properly come within the jurisdiction of central authorities and the courts.

VI. There shall be no active (potentially dangerous) bacterial contamination or gross pollution of properly located and authorized bathing beaches and other bathing places.

Note: The public authorities should recognize in this matter:

1. That notwithstanding the legal rights of riparian owners, in view of our knowledge of the dangers to health arising from bathing in waters contaminated by the bathers themselves as well as from sewage and wastes discharged into them, control is needed both in the selection and authorization of bathing places and of the discharge of sewage and wastes into the waters in which bathing is authorized.

2. That the gross pollution of bathing beaches by suspended matter from sewage or industrial wastes can be prevented, and bacterial contamination may be avoided, by re-location of sewer outlets.

3. That where protection of properly authorized bathing places, from bacterial contamination only, is required, such protection can be secured by such sewage treatment processes as will destroy or remove the bacteria.

4. That where properly authorized bathing places require protection against gross pollution arising from suspended or other objectionable sewage matters, this additional protection can be secured by the installation of such additional sewage treatment processes as will sufficiently remove the objectionable matters.

5. That since active bacterial contamination and gross pollution of bathing places can be prevented by proper location of such places and by proper location of sewer outfalls and proper

treatment of sewage and other wastes, the enforcement of the abandonment or re-location of bathing beaches or of preventive or remedial measures to protect such beaches will obviously depend upon a number of legal and administrative considerations of an economic engineering and public health nature which properly come within the jurisdiction of central authorities and the courts.

CONCLUSION.

Considerable misunderstanding and confusion exists as to what constitutes a nuisance or a menace to public health. These are questions of effect and intensity of pollution. They involve not alone principles of biology, chemistry and engineering, but also of law and psychology, the determination of which must be left to judicial and administrative bodies such as courts and state departments of health. It also appears to be a fact that whereas much may be accomplished in an endeavor to establish general limitations as to dilution, presence of organic matter, dissolved oxygen and other factors within which a nuisance or menace to public health may or may not be created, present knowledge of these relations is of such indeterminate and variable a character as to preclude definite formulation, and even were formulation possible, it could not usurp the offices of the courts and other judicial and administrative bodies in determining the facts and imposing remedies based upon such facts. It appears, therefore, that the code of regulations herein provided, goes as far as present knowledge of the subject warrants.

HARRISON P. EDDY, *Chairman.*
EDWIN A. FISHER.
PAUL HANSON.
THEODORE HORTON.
W. H. DITTOE.

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ANOTHER SHORTAGE OF SALVARSAN.

The indications are that the supply of salvarsan and neosalvarsan in this country has again reached the point of exhaustion. To the medical profession, who know the unfortunate results of a shortage of salvarsan on the health of the present and future generations, the situation is an exasperating one. Is there no remedy? Is our government impotent to relieve the condition? Congress made our patent law; it certainly has the power to suspend the patent on any preparation that the patentee is unable to, or does not, supply when such suspension is in the interest of public health. It is well known that at the time of the previous shortage the Dermatologic Research Laboratory of Philadelphia manufactured the product under the name of arseno-benzol.* It is presumed—at least hoped—that in the present shortage the laboratory will again manufacture the product. It should meet with no legal difficulty, as the agents for the salvarsan manufacturers have intimated that they would not object to such supply of the product at times when they themselves were not able to furnish it. But such a relief for the situation is not a permanent relief—it is a makeshift. Monopolies on medicaments such as diphtheria antitoxin, salvarsan and the like are against public interest. The United States has granted process and product patents on salvarsan: even if any one in this country produced a salvarsan product or derivative which would be more curative and more valuable—on account of being less toxic, for instance—the patentees could effectually prevent its manufacture and sale. Again it should be emphasized that the fact that a most important drug is unavailable is the result of an act of Congress, and Congress, has the power to modify its action so that the remedy may be made available.—*Journal of the American Medical Association.*

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*A Canadian product, diarsenol, was also, and for that matter is still, available.

REPORT OF COMMITTEE ON REFUSE COLLECTION AND DISPOSAL.

Read before the Sanitary Engineering Section of the American Public Health Association, Cincinnati, Ohio, October 27, 1916.

SINCE the last convention of the Association in Rochester, in the fall of 1915, there have been a number of interesting developments in the practice of refuse collection and disposal. These developments are briefly reviewed herewith.

NEW PLANTS.

Among the interesting new plants built is one at Decatur, patterned somewhat after the new Hamburg plant in Germany, and designed to burn mixed refuse. This plant is one of the few mixed refuse incinerators built in small cities during the past year. The plan contemplates mixed collection of refuse from the houses.

Another interesting development which has received some attention in the press, is the garbage reduction plant at Pontiac, Mich, with a capacity of five (5) tons per day. For small towns interested in garbage disposal by reduction, this plant offers much of interest. It is located two (2) miles outside the city.

Of particular importance has been the growing interest in the new Cobwell System of garbage reduction. Plants of this type have been built at Los Angeles, Cal., the Panama Pacific Exposition, and New Bedford, Mass. A plant is proposed for New York City. The most interesting feature in the process is that the cooking, de-watering, de-greasing and drying of the garbage are carried out in one receptacle without exposure to the air. After the garbage is placed in the receptacle nothing is exposed to the air until the tankage is taken out ready for shipment. The chance for odors is thus largely reduced.

Many small incinerating plants have been built. There has been a uniform advance in the disposition of city officials to give more attention to the investigation and the preparation of plans and specifications in advance of construction.

INVESTIGATIONS.

During the year, a number of interesting special investigations of the refuse disposal problem have been made, and special studies have been continued at New York, and Chicago.

During the current year, investigations and reports have been made at Kansas City, Mo., Washington, D. C., and at Danville and Galesburg, Ill. A particularly important feature in these reports is the special attention that has been given to the collection part of the problem, both as regards the cost and location of disposal works, and the efficiency of the service as a whole.

COURT CASES.

There have been several very interesting court cases on the question of garbage and refuse disposal. One of these, at San Francisco, on the question of fulfillment of guarantees for a refuse incinerator is to come to trial. This case is similar to that which was on trial a year ago at Atlanta.

At Worcester, Mass., hearings have been held on the operation of the city pig farm for garbage disposal. Much interesting information has developed.

At Philadelphia, an interesting case came up regarding odors from the rendering plants along the Schulkyll River. The question of whether odors resulted from the sewage pollution in the Schulkyll River or the rendering plants formed a large part of the controversy.

At New York City, at present, there is much interest over the location of a large garbage reduction plant on Staten Island. The officials of the City of New York favor the undertaking, whereas the residents of Staten Island have combined in an attempt to prevent the location of the plant at this point. No settlement has been reached.

General.

As indicating recent progress, there are one or two general points of interest, to members of this association. The Michigan State Board of Health, for instance, have undertaken to make tests of all newly installed garbage plants, and where practical are having recording pyrometers installed at incinerators. This is a laudable attempt to improve the operation of garbage disposal works.

At Milwaukee, Wis., and Savannah, Ga., a considerable amount of steam has been generated at mixed refuse incinerators and made useful for other purposes in the municipality. At Savannah, steam is used at the water works pumping station. At Milwaukee, the steam is used for generating electricity, which has been sent several miles to a pumping station, which pumps lake water into the Milwaukee River for flushing purposes.

Further information from these sources can be secured by writing to the officials of the various municipalities mentioned or to members of the Committee.

Respectfully submitted,

Samuel A. Greeley, *Chairman.*
Rudolph Hering.
Wm. F. Morse.
E. R. Conant.
W. T. Knowlton.

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WHY NOT TEACH FIRST AID?

Too many times when someone is injured in a factory there is a lot of confusion and running about, everybody advising and giving orders, and very likely no one who is able to give any real first aid.

Safety organizations in factories are helping this situation wonderfully, but wouldn't the good spread more rapidly if trade, technical, vocational and manual training schools included some actual training in first-aid—something more than posting in the electrical laboratory of rules to follow in case of electric shock.—*Factory*, April

PROGRESS REPORT OF THE COMMITTE ON VENEREAL DISEASES.

Read before the Public Health Administration Section of the American Public Health Association, Cincinnati, Ohio, October 25, 1916.

To the members of the Section:

YOUR committee has continued its work of collecting data upon meritorious experiments in dealing with the treatment and prevention of venereal diseases. As the material thus collected is largely available through correspondence addressed to the committee, or reprints which will be sent upon application, further reference to it is eliminated from this report. As an illustration of the various types of activities which are now being carried on with evident success the committee presents a series of charts upon the educational, diagnostic and treatment aspects of the problem. The conferences, correspondence and personal interviews which the members of the committee collectively have held during the year suggest the following points for consideration at this time:

1. That discussions of venereal diseases as a public health problem, be based on recognition of three essential factors—

(a) Discovery, treatment, instruction and control of infected individuals.

(b) Reduction of opportunities for dissemination by improvement of environment and limitation of infections by carriers.

(c) Instruction of uninfected individuals in methods of protection.

2. That the details of public health administration in relation to venereal diseases be considered under the separate headings:

(a) The eradication of syphilis.

(b) The eradication of gonococcus infections.

3. That the eradication of these diseases be always discussed with the scientific possibility of their ultimate eradication in mind, in order to safeguard such discussions and resulting lines of action from the errors of expediency and inconsistency.

In presenting these rather trite suggestions, your committee has in mind the difficulties of its members in freeing even its own early discussions from the prejudices and misunderstandings which arise from the complicated medical, social and moral aspects of the problem. If the first suggestion be adopted, prostitution and sex education must necessarily rank with reporting, diagnosis, and treatment as factors in the eradication of these last among the great uncontrolled plagues afflicting mankind. If the second suggestion be adopted, the preventive medicine phases of venereal diseases may be considered without conflict with the curative medicine phases related to dispensary and hospital management of treatment. If the third suggestion be adopted, administrative measures decided upon will mean permanent progress—no matter how slowly such progress may be recorded.

In presenting these suggestions,

your committee has purposely worded these "rules" for discussion so that the proponents, as well as the opponents of any of the administrative measures now on the firing-line, such as reporting of venereal diseases, the segregation and the medical inspection of prostitutes and the like may have equal opportunity to present their views. The committee's own views on many of these questions have been expressed in previous reports. As a concrete recommendation for the coming year, the committee proposes that each of the members of the section endeavor to arrange one joint meeting of the County Medical Society and Health Officials in his community for the discussion of this problem along the lines herein suggested, and that the data collected by the committee be utilized by the speakers selected for debate.

The resignations of the members of your committee are herewith tendered, with the recommendation that the committee be continued.

Respectfully submitted,
William F. Snow, *Chairman.*
William A. Evans.
John N. Hurty.
John H. Landis.
Powhatan S. Schenck.

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SECOND CLASS MAIL PRIVILEGES DENIED TO CITY HEALTH DEPARTMENTS.

From a note published in the *Weekly Bulletin* of the New York City Department of Health we learn that publications of *municipal* health departments are no longer to be carried at second-class rates of postage under the Act of 1912, the postal authorities having decided that the terms of this act limit this privilege to publications of *state* departments of health. Attempts made by the New York City health authorities to secure an amendment of the postal laws were only partially successful; the amendment was adopted by the Senate but failed of adoption by the House.

This is a matter vitally concerning health officers throughout the country. Published, as they are, to promote the public health, and carrying no advertising matter of any kind, health bulletins of municipal health departments should be entitled to the same mailing privileges accorded to the bulletins of state health departments. It is a short-sighted policy, and false economy of the rankest kind to curtail the dissemination of public health bulletins. The few dollars saved to the postal service will be insignificant compared to the loss to the people by preventable diseases, occurring because health bulletins were not distributed.

If the interpretation put on the present laws by the U. S. postal authorities is correct, Congress should at once take steps to right a ridiculous situation. The people cannot afford to do without the excellent bulletins issued by municipal health authorities throughout the country, and it is manifestly unfair to ask the various cities to carry the burden of mailing these bulletins at regular postage rates. We urge our readers to work for second-class mail privileges for city health departments.

METHOD OF DISTRIBUTING AND COLLECTING DIAGNOSIS OUTFITS FOR THE BUREAU OF LABORATORIES IN CLEVELAND.

R. G. Perkins, M. D.,
Bureau of Laboratories of the Cleveland Division of Health.

Doctor Perkins tells how one feature of health department routine is carried out in one of our large cities. This is a well written paper which will prove of particular interest to laboratory workers and communicable disease men.

CLEVELAND is a city with a present population of over 650,000 (1916 estimate), and an area of about 52½ square miles. The Health Division is situated at about the center in an east to west direction, but almost at the northern border, so that the outlying districts to the south are about four miles away, and those to the east and west about six to eight.

In a city so spread out it is clear that there must be a number of places at which the various outfits are accessible to physicians, and ever since the beginnings of the laboratory there have been branch stations in which a number of these were kept on file. These were established at the police precinct stations, of which there are fourteen for the twenty-six wards, and at such drug stores as agreed to care for them. It was the custom to have the branch stations telephone in whenever there were any used outfits left in their charge or when the supply of unused outfits was running low. This custom, however, was more honored in the breach than in the observance, and it was not infrequent to have specimens delayed one or two days before reaching the laboratory. This caused justifiable complaints, and it became obvious that improvement was necessary.

The present plan has been in use for three years and has proved eminently satisfactory, and will be continued. The arrangement is as follows:

Branch stations are established at all the fourteen police precinct stations, and at 18 drug stores scattered over the city in localities convenient of access to the physicians of that district. In each of these is kept a constantly adequate supply of the various outfits in use by the laboratory. These may be obtained by physicians or on their order, and in each case the physician must receipt for the outfit by its laboratory number, so that it may be known where outfits are when they do not return to the laboratory. The outfits at present in use cover diphtheria, typhoid, tuberculosis, gonorrhœa and syphilis. With regard to all except diphtheria it is clear that a delay of a few hours is not vital, but in that disease rapid diagnosis is essential. Even when the outfits were brought to the laboratory as soon as possible after notification, it was necessary to incubate the cultures, so that it was often impossible to get a diagnosis within twenty-four hours. It was therefore decided that incubators should be established at the police stations so that cultures deposited in them at any time in the afternoon or evening would have been incubated over night and would be ready for immediate diagnosis. It was of course impossible to establish incubators at the drug store stations, but this difficulty has been surmounted in a fairly simple and inexpensive manner. It has been arranged with the great majority of the sub-stations that they will send over each evening to the nearest police station all such outfits as may have been left at them during the day, and see that the diphtheria outfits are placed in the incubator. For this service a small messenger fee of from ten to fifteen cents is paid on presentation of a monthly statement as to the dates and the outfits sent over. By checking this with our own records, showing which stations the outfits came from, it is easy to avoid false charges, and indeed since the system was started we have found no such attempt. On the lists of sub-stations sent to each physician in the city we have noted such as are unable to offer messenger service to the police stations, so that if an early diagnosis is desirable, the physician can take the outfit to the nearest place where the service is complete. There is a steady increase in the number of physicians who take their diphtheria outfits to the nearest police station and put them in the incubator personally, thus adding to the assurance of prompt service and reducing the bills for special messenger service.

Every morning at about six o'clock the laboratory messenger starts on a round of the police stations, from each of which he collects all the outfits that have been used, replacing these or any which have become defective for any reason with new ones, and recording the temperature of the incubator as well as other conditions which may seem advisable. He records in his book the numbers of the used outfits and the numbers of any outfits left, making a current record which gives a complete check.

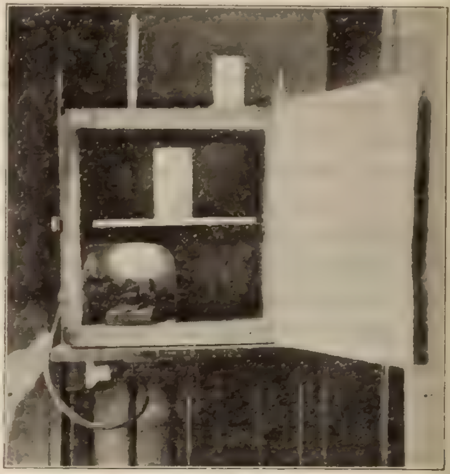
At the ordinary rounds the sub-stations other than the police stations are not visited, but in the afternoons another trip is made when it is necessary to fill out the supplies at such stations. No diphtheria antitoxin is left in any of the drug stores, but an adequate supply is kept at each police station. This is again of benefit in that the physician in a suspicious case will usually bring in his culture to the police station incubator when he comes for the antitoxin, which is distributed free of charge by the Health Division.

The total mileage necessary for a visit to each of the stations is about sixty a day, and by the method above outlined it is possible to have one messenger collect all the outfits from both the East and West Sides and get them to the laboratory early enough to have the diphtheria diagnoses telephoned before the lunch hour. The other outfits are examined after the diphtherias are disposed of.

In this way a physician can take a culture up to midnight and get a diagnosis by lunch time, a great improvement on the former system.

The outfits are of the usual types, and each contains an unstamped return postal card, on one half of which the physician fills out the usual brief history, the other half being filled out by the laboratory and mailed to his office. In diphtheria cases, those sent in for diagnosis are telephoned; those for release are not, but postal cards as above are sent in both cases. There are two marked advantages in this scheme over the soft folded blanks which are answered by a separate sheet filled out in the laboratory. In the first place the laboratory number is stamped on each half of the return cards, and these are not separated until the positive or negative stamp (the former in *red ink*) is applied to *both*, thereby avoiding any possible error, and in the second place they are much more convenient for filing, and much more accessible. A live file of all cases under quarantine is maintained, so that at any minute the total of these, their distribution, and any other points about them, may be easily obtained.

A description of the incubators may be of value, as this would appear at first sight to be a great expense. They were built from our specifications by a local sheet metal worker as follows: They are made of galvanized sheet iron, with double walls one inch apart, the intervening space being filled with mineral wool, and the outside walls at the top and back allowed to project about two inches, making a safe shelf for the typhoid and tuberculosis outfits. In the center of the top is a ¾-inch hole for the thermometer, and a similar hole ½ inch above the *inside* bottom for the electric wires. The available inside dimensions are 11 inches in height, 10 inches in width, and 9 inches from the front to the back. Five and one-half inches from the bottom is a shelf of perforated sheet iron so arranged as to leave about one-half inch front and back for air circulation even when the incubator is filled. This will hold 35–40 of the diphtheria outfits used by this laboratory. The hearing element is a 4–8 candle power carbon lamp, fitted to an ordinary wall rosette, and the temperature is controlled by the familiar Manhattan thermostat, of metal and hard rubber. An extra piece of sheet metal is fastened under the shelf so as to shield the lamp. The expense to us three years ago was $39.00 for 14 incubators, including everything except the lamp itself, the regula-



tor, and the thermometer. The thermometers were selected from ordinary dairy thermometers standardized against the laboratory thermometer, and cost $10.25 apiece; the regulators cost $0.72 apiece, and the total expense of each outfit complete was less than $5.00. The current used in each incubator costs about one and a half cents a day. These have now been in service for three years and are as good as new. There are occasional variations of two to three degrees, but as a usual thing the variation is one degree or less. We set them at 36° C. so that with this variation the only probable danger is from insufficient heat.

The weakest point in the series is of course the actual collection. We find, however, that with one messenger and a motor car we are able to accomplish both collection of used outfits and distribution of fresh outfits satisfactorily in the time allowed. We, however, found that unless a fairly adequate scale of wages is offered, it is difficult to get a man who will be conscientious and who will drive the car in a conservative manner. We tried a three-wheeled motorcycle at first, but this was proved unsatisfactory, as with the three tracks it was impossible to avoid ruts and holes in the pavements. We would recommend, therefore, that a small motor car be used for this purpose.

The statement mailed to each physician with a list of the sub-stations is appended, together with a photograph of one of the incubators now in use.

City of Cleveland

Division of Health

Bacteriological Laboratory

City Hall

In order to render earlier reports and increase the efficiency of the diagnostic work of this laboratory, the method of collecting diphtheria, typhoid and sputum specimens has been modified.

Outfits will be kept at the drug stores named in the accompanying *revised* list, and *no collections* will be made from these by the laboratory messenger. Arrangements have been made with the druggists to deliver *each evening* to the nearest police station such outfits as have been left with them by the physicians.

Incubators have been *placed in each police station* indicated in the list given herewith. *The laboratory messenger will call each morning at the various police stations to collect outfits.*

Diphtheria cultures placed in these incubators (typhoid and sputum specimens should be placed on top and *not inside* these *incubators*) as late as midnight should be ready for microscopic examination at the laboratory the next forenoon. Physicians can facilitate the work by leaving their specimens so far as possible at the police stations.

Note: The outfits supplied by the Health Division *are to be used in sending specimens to the city laboratory only*, and *not for private use.*

Persons found misusing these outfits will be required to pay for same.

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Books Reviews.

Water Works Handbook. *Alfred Douglas Flinn, Robert Spurr Weston and Clinton Lathrop Bogert. McGraw Hill Book Co., New York: 1916. Pages 824, illustrated. Price $6.00 net.*

This work is, according to its authors, "a compilation of information old and new for the waterworks engineer and superintendent, the designer, constructor, operator and inspector." It is in fact a most useful and usable compilation of a large amount of practical material and as a source of ready reference for one interested in waterworks will prove most valuable.

In the progress of sanitary science it is becoming increasingly evident that those in official charge of the health of a community must come into somewhat intimate contact with the community's water supply. Health officers should, therefore, have some familiarity with the general problem of water supply and the more intimate their knowledge of certain details of this important phase of community life the better are they able to perform their specific function of guarding the community's health. The present review, therefore, will deal in the main with those matters which are of particular importance to the health officer.

The work is divided into five parts dealing respectively with the sources, collection, transportation and delivery, distribution, and character and treatment of water. The discussion of rainfall and of ground water in the opening section is of practical interest in that it furnishes a very satisfactory foundation for a proper appreciation of uses and dangers of wells and springs. The subject of wells is considered more at length under the general heading of collection of water where the details of well construction and testing will be found. The parts of the work dealing with transportation and distribution of water contain a great deal of technical information, some familiarity with much of which would enhance the value of a health officer's services. His chief interest, however, will be directed toward the last part dealing with the character and treatment of water. Here he will find in most compact and thorough arrangement a discussion of properties and classification of waters with numerous examples of chemical and bacteriological results classified by types of water and by sources. The all important subject of wells and ground water supplies is again dealt with more particularly from the hygienic standpoint and the tabulated data include several references to algae in waters and a discussion of the associated matter of odors. Specimen analyses of the waters of American rivers, of some foreign rivers, of rain, snow, springs, wells and ice, and of the waters of the seven seas are given in tabular form. The chapter upon inspection of sources is particularly valuable and includes copies of rules and regulations for the protection of watersheds adopted by the cities of Boston and New York and a specimen contract for the supervision of labor camps upon watershed drainage areas. Storage as a purifying mechanism is discussed at length with special reference to the effect upon bacteria, color and turbidity. A brief treatment of the general principles of water purification by the various accepted types of treatment follows, especial emphasis being given to chemical disinfection and automatic feed apparatus for various chemical treatments. A chapter upon water softening deals both with the desirability and methods of applying this treatment.

No special search has been made by the reviewer for errors or misprints, but the term "phenol equivalent" upon page 675 will be readily understood by any health officer as having been intended for phenol coefficient. Table 224 upon the same page also contains an obvious error in recommending the use of a 2 per cent. solution of disinfectant in sufficient quantity to give a 2 per cent. mixture of the disinfectant in the final mass. This error is repeated several times in the table.

The health officer will find in this work a great deal of information which he frequently requires and which through his lack of familiarity with engineering literature he generally finds difficult to obtain. The style of the book is midway between that of a manual and the abbreviated style of the engineer's pocketbook; the arrangement, always a difficult matter in works of this kind is reasonably harmonious and consistent and is assisted by an extensive and detailed index.

Earle B. Phelps.

Microbiology. *Edited by Charles E. Marshall. Second Edition. P. Blakiston's Son & Co. Philadelphia, 1917. Pp. 861. Cloth, $3.00 net.*

The second edition of Microbiology edited by Prof. Charles E. Marshall, Professor of Microbiology and Director of the Graduate School of the Massachusetts Agricultural College, Amherst, Massachusetts, will be welcomed by both teachers and students of this important study.

The subject is a large one to be handled in a comprehensive manner in a single volume but this has been accomplished by careful attention to the subject matter and the elimination of all superfluous matter.

The names of the collaborating authors, of whom there are twenty-five, furnish in themselves a proof of the excellency of the work. The list of these contributors, each a recognized expert in the subject he presents is as follows:

F. T. Bioletti, Berkeley, Cal.; R. E. Buchanan, Ames, Iowa; M. Dorset, Washington, D. C.; S. F. Edwards, Lansing, Mich.; E. Fidlar, London, Ontario; W. D. Frost, Madison, Wis.; A. Guillermond, Lyons, France; N. Mac L. Harris, Chicago, Ill.; F. C. Harrrison, Quebec, Canada; E. G. Hastings, Madison, Wis.; H. W. Hill, London, Ontario; W. E. King, Detroit, Mich.; J. G. Lipman, New Brunswick, N. J.; W. J. MacNeal, New York, N. Y.; E. F. McCampbell, Columbus, Ohio; Z. Northrupp, E. Lansing, Mich.; E. B. Phelps, Washington, D. C.; O. Rahn, Elbing, Germany; L. F. Rettzar, New Haven, Conn.; M. H. Reynolds, St. Paul, Minn.; W. G. Sackett, Fort Collins, Colo.; W. A. Stocking, Ithaca, N. Y.; C. Thom, Washington, D. C.; J. L. Todd, Montreal, Quebec; E. E. Tyzzer, Boston, Mass.

The text has been divided into three distinct parts, the first dealing with the morphology and culture of microörganisms, including molds, yeasts, bacteria and protozoa.

The second part deals with physiological problems, such as the nutrition and metabolism of microörganisms and the effect of physical or chemical influences.

These two considerations pave the way to the third and major portion of the book which deals with applied microbiology as related to the problems met in the study of professional or practical affairs.

This portion of the book has eight divisions, each composed of several chapters, and presenting in detail such important subjects as Microbiology of Air, of Water and Sewage, of Soil, of Milk and Milk Products, of Special Industries, Microbial Diseases of Plants, Microbial Diseases of Insects and Microbiology of the Diseases of Man and Domestic Animals.

The whole subject matter as presented in the first edition has been thoroughly revised and rearranged, there are several new contributors and much new material has been added. There are 184 illustrations as contrasted with 129 in the first edition, the book is printed with good, readable type, is well bound and of convenient text-book size.

Francis H. Slack, M. D.

Personal Hygiene and Physical Training for Women. *By Anna M. Galbraith, M. D., Second Edition. The W. B. Saunders Company, Philadelphia. 12mo of 393 pages, illustrated Price $2.25.*

The first edition of this work has been favorably reviewed in this Journal. Attention may be called again to its great value especially in the hands of teachers of young women and girls. While it is a book of moderate size it is remarkably inclusive. Much that is written on personal hygiene seems to the average reader to be a repetition of platitudes; in other cases it enforces a peculiar point of view and fails to be convincing. The present treatment is a happy one: the matter set forth is not too obvious to be interesting and at the same time it is not at all eccentric. A historical method is followed with advantage in the discussion of dress, physical training, and education for women.

Doctor Galbraith places emphasis upon posture as related to health. This contrasts decidedly with Doctor Cabot's recently printed opinion that the value of good posture is chiefly psychological—an opinion which surprised the reviewer. The subject of nutrition is well handled though it may be remarked that 100 grams of protein a day is a high estimate for an American student. The chapter on Mental Hygiene is sane and helpful.

Percy G. Stiles

Food Study. *By Mabel Thacher Willman. Little Brown, and Company, Boston, 1917. pp. 324. $1.00.*

This book is one of the best of the recent textbooks on foods for high school students. The material is clear, direct and up-to-date. The author even dares to suggest that hard boiled eggs may be digested and that alum baking powders are not injurious. The reader is somewhat startled at the unconventional order of presentation of subjects, but examination shows that the author has a logical sequence of her own which is rather pleasing. Some of the subjects are introduced by experiments which are for the most part skillfully applied. Following the essons are references and questions to stimulate further thought and reading. This feature would make the book acceptable to home study clubs. The appendix contains some material on food requirements and a list of additional dishes to illustrate the principles taught in each chapter of the book. Recipes for these dishes are not given because the author believes that every girl should know how to use a cook-book as well as to be somewhat independent of the printed recipe because of a knowledge of principles. A trial of the book as a text would be stimulating and refreshing to the high school teacher.

Ula M. Dow.

Department Reports and Notes

REPORTS

Los Angeles, California

Based upon an estimated population of 500,000, the Annual Report of the city of Los Angeles for the year ended June 30, 1916, records a mortality rate of 12.10, an increase of 313 deaths over the previous reported year. In the rate are included deaths of the many non-residents who had taken advantage of the city's excellent hospital facilities. Of the 140 suicides it is rather astonishing to note that only 5 were born on the Pacific coast, 60 being foreign born, and 75 being born in the Atlantic states. Three hundred and twenty seven deaths were caused by accidents.

Five hundred and sixty-two deaths occurred in children under 1 year of age, making 9.28 per cent. of deaths from all ages, a rate of 72.45 per 1,000 living births; 99 or 17.61 per cent. of these deaths were due to diarrhea and enteritis; 125 due to premature birth; 98 due to some form of pneumonia. Three hundred and ninety-two less living births were reported than during the previous year, due, it is believed, to non-reporting by physicians and midwives. Nurses were detailed to investigate the cause of this, and it is expected that such reporting will be improved during the present year. The report of the Division of Obstetrics, under Dr. L. G. McNeile, shows most active work being carried out along the lines of maternity dispensaries, two of which are established, prenatal care both in the dispensaries and in the home, care during delivery, postnatal care, the furnishing of complete baby clothing outfits, and maternity nursing, which well account for the very commendable low infant mortality rate. These activities were further aided by the issuance and wide distribution of pamphlets in English, German and Spanish on "Advice to Prospective Mothers."

To the department there were reported during the year 2,610 cases of tuberculosis, 383 of which were not reported until death; 717 of these were reported from the county hospital. Nine hundred and ninety-eight, or 16.48 per cent. of all deaths, were reported from this disease, 115 of which were of natives of the city and 38 natives of the state outside. This is indeed a problem for this city, a problem which the department of health has not shirked. Active and efficient administration has been directed along this line and has resulted in the establishment of four tuberculosis clinics, and the maintenance of two half time assistant health commissioners, and a number of tuberculosis nurses, who not only conduct the clinics but visit indigent patients, who are unable to come to the clinics, at their home. Complete coöperation exists between the department and the Los Angeles Society for the Prevention of Tuberculosis. The reports of the individual clinics furnish conclusive evidence as to the effectiveness of the department's endeavors.

Fifty-one cases of smallpox were reported, 37 of those infected never having been vaccinated, and 10 being vaccinated in childhood. No deaths resulted. Six hundred and eighty-four cases of diphtheria were reported with a case fatality of 4.37 per cent., or 6 per 100,000 population. Three hundred and twenty-four cases of scarlet fever were reported with 2 deaths. There occurred 21 cases of poliomyelitis with 2 deaths. Nineteen cases of cerebro spinal meningitis were recorded with 14 deaths. Of the 8 cases reported as cerebro spinal fever, or epidemic form, 5 received the Flexner serum, one dying. One thousand two hundred and eighty-eight cases of chicken pox were recorded, and here too, we find evidence of the negligence of the public in regard to this disease. Five deaths from measles were reported from 668 cases. One thousand two hundred and eighty cases of whooping-cough resulted in 25 deaths, a case fatality of 1.95 per cent. The department intends during the present year to put in force a quarantine or placarding of houses where this disease exists. Eight hundred and fifty-four cases of venereal disease were reported, 372 more cases than reported for the previous year—a good sign of improved reporting.

Increased activity is to be noted in the report of the laboratories due to a greater activity of the milk inspection division in collecting samples and special investigations. The division of milk inspection reports most interestingly on the conditions of the dairies and cows included in this city's milk shed and shows that a high standard is being maintained in this connection. In scoring the dairies it is shown that an average of 60.3 was obtained, an increase over the previous year of more than four points. Inspection of meat, restaurants and bakeries has been conducted by a force of ten inspectors whose work has proven most satisfactory. The division of sanitary inspection has been active in trapping and poisoning rats and squirrels, a preparatory measure in preventing the spread of any disease conveyed by rodents which might possibly be introduced in certain localities. Considerable nuisance abatement was affected though this problem has been rendered most difficult by personal spite between neighbors, and ignorance.

In the matter of school inspection the 120 city schools are divided into six districts and one nurse assigned to each district. In this manner it has been found possible to inspect each child individually, treating where necessary and doing other health conservation work. Though the work for this division has materially increased due to annexation the force has remained as before.

The main features of the interesting report of the Bureau of Municipal Nursing is the increase in the number of tuberculosis clinics, particularly the opening of a children's open air clinic; and the experiment of creating a small district in which one nurse shall do all the work—district, school, and tuberculosis.

The expenditures of the department amount to $146,500. The financial statement represents a complete statement of functional activities and shows a wise proportion of expenditures.

The report as a whole, like most of our Pacific coast reports is exceptionally well prepared, well illustrated, and complete. The work itself is set forth with a nice regard for sequence and relative importance of the many activities reported and is one of the few reports of this nature which would interest the laymen, which indeed is its function. Health Commissioner Powers is indeed to be congratulated upon this report as well as upon the excellent showing of the activities of his department as described in it.

Cumberland, Maryland.

The Seventh Annual Report of the Department of Health of this city of some 26,000 inhabitants first calls attention to four excellent new activities instituted during 1916, which, it is stated, have already justified their installation. Briefly these are: The employment of a trained man to supervise the production and sale of milk, culminating an effort of several years' standing, which by the improvement of dairy scores and laboratory examinations, and possibly by the reduction of deaths from diarrheal diseases in children under two years of age proves itself most worth while; the issuance of a monthly bulletin of excellent quality, which has done much in educating the general public and extending their appreciation of the health department's activity; the monthly scoring and rating of bakeries and restaurants, which has tended to secure greater patronage for those establishments which maintain sanitary conditions; the establishment of a plan whereby senior nurses of the Allegany hospital will spend a month or more in visiting new born babies and in instructing mothers in the proper care of infants, which should do much to reduce the somewhat high infant mortality rate reported during the year.

The mortality rate of 12.77 per 1,000 population reported for 1916 is in excess of that for 1915, due, it is believed, to the results of measles and influenza, which reached epidemic proportions, especially in the case of measles, of which there were reported 1,125 cases with seven deaths. In this connection, possibly a direct result of the monthly health bulletin can be detected from the fact that over half of these cases of measles were reported to the department by the parents. Fifty-seven cases of diphtheria were recorded with a case fatality rate of 10.5. Epidemiological studies were made of the school children with the detection of a surprising number of carriers. Upon exclusion of these carriers from school and proper isolation, the outbreak of this disease soon subsided. Thirty-four cases, mostly "mild," of scarlet fever were reported with no deaths. Typhoid fever gave the lowest rate on record for this city, 50 cases with three deaths being reported. The reduction of disease from this cause in this city since 1913 has been most striking. Two hundred and twenty-six doses of typhoid vaccine were administered during the year. Ninety-one cases of tuberculosis with 26 deaths within the city were reported. Poliomyelitis remained normal. Whooping-cough caused three deaths. A serious increase was recorded in the infant mortality rate, 112 per 1,000 births. The department realizes that this is the most important problem on its hands, and remedial measures are under way which should do much to improve the existing conditions. While professing belief in the principle of supplanting fumigation by thorough cleansing, Mr. Max Colton, health officer, has not as yet been able to win over public opinion sufficiently to take this more advanced step.

The effect of the appointment of the milk and dairy inspector in August of 1916 is well exhibited by his report which states that in August only 17.54 per cent . of the dairies rated had a score above 50, while in December 55.34 per cent. scored above 50. The quality of the milk has also greatly improved.

It is unfortunate that a detailed financial report can not be included in this report, for it would be interesting to note the functional expenditures of the department which maintains such diverse activity on an appropriation of $5,000.

The recommendations made deal to a great extent with the sanitation and hygiene of the outlying districts. Specific recommendations call for two public health nurses and one veterinarian for meat inspection, which would necessitate nearly doubling the present appropriation.

Norristown, Pennsylvania.

"A few facts worth knowing told in a line" is the title of one of the preliminary pages of the 1916 Report of the Department of Health of this city of 32,000 population, and in it are concisely stated the records for the year as reported by the department. In it we are told that the death-rate, excluding "violent deaths," was 12.03, 61 more deaths than reported in 1915, with an average age of death of 39 years.

Eighty-three deaths resulted from reportable diseases. Of the 893 cases of contagious diseases reported, 613 were cases of measles, 88 of diphtheria with 11 deaths, and 7 of scarlet fever. Poliomyelitis was reported 19 times, with 2 deaths. Typhoid fever was reported 41 times, an increase of 18 over 1915. It is thought that such an increase was due to an infected milk supply. One hundred and three deaths of infants under 1 year of age were recorded, which would give the high infant mortality rate per thousand living births of approximately 151. The expenses for the department for the year amounted to $2,507.

Among the repeated recommendations of the department are: A public convenience station; a public dumping ground, properly looked after; a contagious disease hospital; enforcement of the spitting law; cleaner street; and employment of a dog catcher regularly.

The report itself is extremely brief and incomplete. No rates are furnished, and beyond "drastic measures" no indications are given as to the department's activities in conserving health. An interesting sidelight is thrown on the expenditures of the department, when it is stated that over 20 per cent. of the expenditures were used for the employment of special quarantine officers to enforce quarantine in a number of cases of infant paralysis.

NOTES

Typhoid Fever in the Large Cities of the United States.—The *Journal of the American Medical Association* presents its fifth annual report of the typhoid fever mortality in those cities of the United States having over 100,000 population. The cities reported number sixty, and are grouped as previously, according to size. The first group includes cities over 500,000, and is led by Boston which reports 3.5 deaths per 100,000; New York is second with a rate of 3.8; and then follows Chicago, 5.2; Cleveland, 5.3; Philadelphia, 7.8; Pittsburg, 8.6; St. Louis, 9.4; Detroit, 15; Baltimore, 18. All but St. Louis, Philadelphia and Detroit show improvement over 1915, and all show improvement over the 1911–1915 average.

The second group includes those cities with populations between 300,000 and 500,000, and is led by Seattle with a rate of 3; then follows Los Angeles, 3.1; Cincinnati, 3.4; San Francisco, 3.4; Newark, N. J., 5.3; Minneapolis, 5.8; Buffalo, 10.9; Washington, D. C., 12.6; Milwaukee, 14.9; New Orleans, 23.4. The most serious increase is noted in the case of Milwaukee, which in 1915 reported a rate of 4.5. The increase was due, it is believed, to a general water carried infection in the first part of the year. San Francisco, Cincinnati and Los Angeles gave the most marked improvements.

The third group (cities from 200,000 to 300,000 population) was led by Portland, Ore., with a rate of 4.6; St. Paul reported a rate of 4.9; Providence, R. I., 5.1; Rochester, N. Y., 5.1; Jersey City, 6.8; Denver, 7.2; Louisville, 9.7; Kansas City, 10.6; Columbus, 13.4; Indianapolis, 26.6. The rates on the whole are somewhat like those for 1915, with the exception of St. Paul, Providence, and Louisville which showed marked inprovement. Indianapolis suffered a particularly bad typhoid year, due to an outbreak in January and August. Louisville reports the lowest rate yet reached by a southern city.

Paterson, N. J., led group 4 (cities from 125,000 to 200,000) with a low rate of 1.4, the second lowest recorded for the country; next followed Spokane with a rate of 2; then Worcester with 3.7; Oakland, Cal., 4; Omaha, 5.1; Scranton, 5.4; New Haven, Conn., 8; Fall River, Mass., 10.9; Syracuse, N. Y., 12.2; Atlanta, 17.9; Toledo, 22.9; Richmond, Va., 24.1; Memphis, 36.3; Birmingham, 42.6. The group as a whole exhibited many fluctuations, Birmingham, Richmond and Memphis being the worst sufferers, milk seeming to cause the greatest difficulty. A great improvement in the rates of the southern cities is looked for during the next several years. Spokane, Worcester, Oakland, Scranton and New Haven showed marked reductions.

Group 5 (cities from 100,000 to 125,000) was led as last year by Cambridge, Mass., a city which reports a rate of only 0.9, the lowest rate ever reported by a city in this country, and with a remarkably low three-year record. The report states that no other city of its size in the world has ever reported such a low rate, as far as is known. Tacoma, Wash., is second with a rate of 3.5; then comes New Bedford, Mass., with 4.2; Springfield, Mass., 4.7; Trenton, N. J., 6.3; Hartford, Conn., 6.3; Albany, N. Y., 7.7; Bridgeport, Conn., 9; Salt Lake City, 10.2; Camden, N. H., 11.3; Lowell, Mass., 11.4; Dayton, O., 14.7; Grand Rapids, Mich., 15.6; San Antonio, Tex., 16.0; Reading, Pa., 18.7; Nashville, Tenn., 27.3; Dallas, Tex., 27.5. Tacoma, New Bedford, Springfield, Hartford, and Albany report notable decreases, while Camden and Salt Lake City show considerable increases over 1915.

Thus of the sixty cities reported, some 26 per cent. show rates under 5.0; 31 per cent. between 5.0 and 10.0; 30 per cent. between 10.0 and 20.0;

and 13 per cent. above 20.0. And the average from typhoid fever per 100,000 population for these sixty cities representing a population of 24,667,919 (estimated by U. S. Census Bureau methods) was 8.1.

◆

Additional Public Health Legislation Suggested for New Jersey.—Believing that the foundation of all good official public health work is good law, and that the final responsibility for the efficiency of the department of health rests with the legislature, the 1916 annual report of the Department of Health of New Jersey contains a number of recommendations for additional legislation, mostly of the form of correcting or supplementing existing laws. An excellent summary of these recommendations is contained in the February *Health News* of the Health Department of New Jersey.

The first recommendation tends to correct the 1915 law reorganizing the department, and to fix more precisely and satisfactorily the duties of the director and the appointed bipartisan board of eight members. At present the board must concern itself with a mass of administrative detail which might well be done by the director, but which it must do under provision of the existing law.

The present procedure for the control of local boards of health by the state department is too complicated and time-consuming, hence it is advocated that the state department be permitted by law to take charge of a local board in cases of emergency, to require the members of such boards to carry out its orders, and to penalize them if they refuse to do so.

Provision is also requested by which the state department for cause, and after a proper hearing can remove a local health officer for incompetence or failure to perform his duty.

It is recommended that employees of the state department be invested with the power and authority of constables.

It is recommended that the various laws dealing with the reporting of various diseases be amended so as to make the procedure as uniform, simple and easy as possible, and do away with the present confusion in regard to this matter.

It is recommended that an act be passed transferring, in all cases, the vital statistics to the local health boards.

It is recommended that the state department of health be permitted to divide the State into a certain number of sanitary districts, preferably five or six, and to provide for a health officer in each district, who would be an employee of the state department.

Upon economical grounds it is advocated that the law requiring that an annual report of the state department of health be sent to every physician, be amended so that the annual report will be replaced by the department's monthly bulletin.

In order to offset the tendency of the last few years on the part of the legislature to impose on the state department a number of duties which properly should be done by local boards, such as the licensing and inspection of factories where ice cream is made, etc., which seriously interferes in the efficiency of the department, it is advocated that work which is purely local be done by the local boards.

It is recommended that an act be passed permitting the state department by resolution to require that permits must be secured by the owner of any establishment where food stuffs are handled or produced, and that a reasonable fee may be fixed by the department for the issuing of such permits, and that all permits shall be issued annually.

Further changes suggested deal with a change of legal procedure in food law; the power of water departments and companies to protect their supplies; the empowering of the state laboratory to make analyses for private individuals under certain conditions, and to fix fees; the examination of food handlers; the change in the law regulating moving picture booths; the advancement of money for state use by employees; the prohibition of preparations containing narcotics for infants.

◆

Council or Commission Control of Health?—"Whether the control of the centralization of all municipal health activities in Minneapolis shall rest in the hands of the mayor or of the City Council has brought a sharp clash between the Legislative Committee of the council and a Citizens' Committee which was appointed through the council several months ago to make a scientific study of the health system of the city and to draw up a bill embodying the results of its study," states the *Survey* for March 24.

It seems that the bill proposed by the Citizens' Committee provides for the creation of a board of public welfare of seven members, consisting of the mayor and the president of the City Council *ex-officio*, and five others appointed by the mayor, one each year for the term of five years, this board to have entire charge of the protection and preservation of health, the care and management of the hospitals, relief of the poor and the management of all penal and correctional institutions. The medical inspection and promotion of health as carried on by the Board of Education in the public schools was to be exempt.

At the hearing before the Legislative Committee of the council, the council declared the report of the Citizens' Committee to be unfit. A substitute bill was drawn up by the council and was unanimously adopted, which provided that all such work as outlined by the Citizens' Committee should be entirely under council control, with the power of appointment of a general superintendent of health and all other officers and employees thought necessary, the latter to be under civil service.

The *Survey* states that the resulting debate brought out the fact that the city of Minneapolis has one of the least efficient health systems in the country with a per capita expenditure for health work of about thirteen cents. It is stated further that "The department, which at the present time is under council control, does no educational work, there being no funds available for that purpose. Its nursing service is inadequate, the nurses of the tuberculosis division being so crowded with work that they give no bedside care; there are no nurses available for infant welfare or contagious disease service.

"The whole system itself was shown to be antediluvian, consisting of three distinct departments, each responsible to independent boards. First, there is the Health Department with an under-paid commissioner, and an annual budget of less than $65,000, the whole department being under the control of the Health and Hospitals Committee of the City Council. Since, during 1916, the council could not agree upon a commissioner, the city was without one, having only an acting officer. Second, the hospitals, workhouse and relief department are under the Board of Charities and Corrections, a board appointed by the mayor. Third, the health work done in the schools is under a third distinct head, the Board of Education. Thus, like all Gaul, the health work is divided into three parts."

⁂

A Public Health Agent in Massachusetts.—"In line with the Massachusetts precedent of taking the lead in public health work, is the step taken by the Massachusetts Medical Society in deciding to coöperate actively with the public health movements of the State," comments the *Boston Medical and Surgical Journal* for March 22 in speaking editorially of the employment of an agent by the Society under the direction of the Committee on Public Health. The movement had its beginning in the winter of 1914 when a number of physicians and social workers met to discuss methods of stimulating the interest of the public in health matters—each member of the group being interested in a different phase of the work yet all desirous of determining the best manner in which to give to the public reliable information on medical and hygienic subjects.

It was decided that the organization best suited to disseminate such information and to improve the existing conditions was the State medical society. Accordingly in 1915 at the annual meeting of the society it was moved that a committee be appointed by the Council on Public Health "for the purpose of hiring an agent who shall, under the direction of the Massachusetts Medical Society, assist in the dissemination of information and in the carrying on of any function of the society in public health work, legislation, social service, or similar departments of effort." The action was deferred a year, and in June 1916, the special committee voted that such an agent be employed. Mr. E. A. Ingham of the Department of Biology and Public Health of the Massachusetts Institute of Technology was selected as agent for the society. The basis of the work to be followed out by Mr. Ingham is as follows: "1. To stimulate the interest of the medical profession in Massachusetts in sanitation, hygiene and preventive medicine. 2. To stimulate the cities and towns of Massachusetts to employ full-time health officers. 3. To stimulate better work in medical inspection of schools, infant mortality, pre-natal work, district nursing, anti-tuberculosis work, industrial hygiene, sanitary engineering, and the prevention of the common communicable diseases. 4. To investigate the health conditions of the state with reference to public health work."

Mr. Ingham's activity up to the present time has been largely devoted toward stimulating cities and towns of the state to the employment of full-time health officers and public health nurses.

✢

Bills on Public Health and Hygiene.—The *Survey* for March 10 under the department devoted to Social Legislation presents an excellent summary of the many bills before the state legislatures throughout the country which deal with public health and hygiene. Lack of space in these columns prohibits as complete a review of this summary as is desirable. However, a few of the main features may be enumerated here.

A bill is before the New York legislature establishing definite standards and requirements for the practicing of nursing as a profession. Opposition is being raised in Pennsylvania concerning the Gans bill which would annul the existing nursing practice act there and would open the ranks to any person who chose to care for the sick.

The American Social Hygiene Association is following bills in twenty-three states. Compulsory reporting of venereal diseases is proposed in Arkansas, Kansas, New Jersey and North Carolina; Vermont proposes to register persons for whom prescriptions for venereal disease treatment are made up by druggists; prohibiting of marriage of venereal diseased is proposed in Arkansas, California, New Jersey, Oregon, and South Dakota. Other bills of somewhat similar nature are pending in Connecticut, Indiana, New York, West Virginia, New Hampshire, Ohio, and Wisconsin, which would tend to bring the control of venereal diseases within the scope of the health department. Several other bills aimed at the suppression of prostitution are reported from California, Delaware, South Carolina, Washington and Wyoming. Massachusetts would prohibit the employment of students as vice inspectors. Advertisements of "cure," for venereal disease are to be prohibited in Kansas and New Jersey.

Provisions for child welfare work are being considered in New Hampshire and Washington. The National Committee for Mental Hygiene and the Committee on Feeblemindedness report bills for the establishment and extension of institutions for that sort of work in Arizona, Arkansas, California, Delaware, South Carolina, Washington, Utah, Oklahoma, West Virginia, and Pennsylvania. Sterilization of the criminal and insane in state institutions is proposed in Kansas, Ohio, and Oregon. Massachusetts, New York, and Indiana plan greater extension of their hospital service. Massachusetts further plans a very complete program for surveys of feeblemindedness in schools and in society at large.

Many other bills are reported for the promotion of work of the anti-tuberculosis societies; for the extension of hospital service of every nature; for the reorganization of the Ohio State Board of Health; and for the many other protective measures necessary for health conservation.

✢

A Guarantee.—Figuring in dollars and cents and lives, the Connecticut State Board of Health through the medium of its March *Monthly Bulletin* makes the following proposition to the people of that state:

"The State Board of Health guarantees to show one life saved for every $500 placed at its disposal.

"Properly applied funds will conserve life and health. As our neighbor, New York, says, 'Public health is purchasable. Within natural limitations, a community can determine its death rate.'

"So well established has become this fact, and so carefully has the state board studied the conditions in Connecticut that we can go our neighbor one better and make the above definite proposition.

"This proposition means that if the $119,000 asked of this Legislature is allowed, the State Board of Health agrees to save 236 lives within the next two years. It appears to be a big undertaking but it can and will be done if the opportunity is afforded.

"The saving of 236 precious lives is not all—considerable unnecessary illness will be prevented and a great economic saving will be accomplished.

"A human life is valued at $1,700. If it costs $500 to save one of these lives the total saving to the state on an investment of $119,000 will be $401,200 or a net profit of $282,200 on the investment.

"Insurance companies have found that the money they spend to conserve the health of their policy holders is the best investment they can make. So amazing have been the results that they are now spending enormous sums and are reaping handsome profits.

"The prosperity of an insurance company is in ratio to the health of its policy holders and the prosperity of the state is in ratio to the health of its citizens.

"It is the duty of the state to provide for the welfare of its citizens,—it is also its duty to invest the funds at its disposal to best advantage.

"Can a guaranteed dividend of 240 per cent. be ignored?"

◆

Diphtheria Deaths and the Use of Antitoxin.—During the year 1916 there were in the city of Boston 1, 951 cases of diphtheria resulting in 133 deaths, mostly among young children. The January *Monthly Bulletin* of the Health Department of the city of Boston reports the results of an investigation of these deaths, with the conclusion that it "seems reasonable that a certain reduction in the mortality from diphtheria might be obtained by the earlier use of antitoxin. If the clinical appearances are so suspicious that diphtheria seems probable antitoxin should immediately be given without waiting for further development of the disease or for laboratory diagnosis. Of course, in every case of a suspicious throat a culture should be taken, but when the physician's judgment balances to the diagnosis of diphtheria then antitoxin should be given at once, at the time the culture is taken. The inconveniences caused by antitoxin in a case that happens not to be diphtheria are not to be compared with the serious if not fatal results that might ensue from delay in its administration."

The report concludes with the following recommendations for the methods of administration of the antitoxin: mild cases, subcutaneous or intramuscular; moderate cases, intramuscular or subcutaneous; severe cases, intramuscular or subcutaneous or intravenous; malignant cases, intravenous.

Public Health Notes

Application of the Typhoidin Test.—"There seems little further reason to doubt that the skin sensitiveness to the preparations of the typhoid bacillus (typhoidin) described by Gay and Force in typhoid vaccinated individuals and in typhoid recoveries is to a large extent specific." This is the statement of Gay and Lamb in *The Jour. Laboratory and Clinical Medical* for January, 1917.

The typhoidin test consists of injecting intradermally a small quantity of a preparation of dead typhoid bacilli. The criterion of a positive reaction is the presence after 48 hours of a definite indurated papule, plus a reddish areola of at least five millimeters diameter. Such a reaction seems to indicate immunity to typhoid.

The authors report the typhoidin reactions of 154 physicians and nurses at the Presbyterian Hospital, New York, as follows:

I. Of 12 cases giving a definite history of antecedent typhoid fever (2 to 22 years previously), nine, or 75 per cent. were positive to typhoidin;

II. Of 121 cases vaccinated against typhoid, 78 cases, or 65 per cent. were positive to typhoidin. The reactions varied according to the lapse of time since vaccination and to the type of vaccine used, the reaction apparently falling away as time went on. In three to five years after vaccination, only 40 per cent. reacted positively.

III. Of 21 normals giving no history of typhoid or typhoid vaccination, three, or 14 per cent. reacted positively to typhoidin.

Commenting on the first group, the authors believe that while second attacks of typhoid are somewhat rare, nevertheless, the immunity must be considered as relative, as second cases are known to have occurred in from 8 per cent. to 15 per cent. of the instances where massive infection takes place.

Of the presumably normal individuals that gave a positive reaction several conjectures are made: Non-specific susceptibility of the skin; previous abortive and unrecognized attacks of typhoid; the carrier condition.

The authors believe that the positive reaction indicates more or less perfect protection against typhoid. In no person in whom the positive reaction was found, has typhoid developed; while, on the other hand, in three individuals giving a history of vaccination and in whom a negative reaction was subsequently obtained, typhoid fever shortly thereafter occurred.

It is believed that a negative indicates the necessity of re-vaccination against typhoid.

◆

The Schick Test and Natural Immunity.—An exceedingly important hypothesis is stated by Abraham Zingher as a result of his studies on the Schick test. His theory, which he italicizes, is as follows:

A susceptibility to one of the less contagious diseases indicates that the child is also more apt to be susceptible to other contagious and infectious diseases.

He finds that whereas among normal children between the ages of two and four, about 32 per cent. are positive* to the Schick test, among scarlet fever patients, 65 per cent. were positive to Schick; and among poliomyelitis patients, over 80 per cent. were positive to the Schick. In other words, scarlet fever patients are twice and poliomyelitis patients three times as susceptible to diphtheria as normal children. Zingher believes that this is not due to lowered resistance during scarlet or polio, but to lower natural immunity; since no lowering of the amount of antitoxin in the blood is detectable during the course of the disease.

Scarlet fever and polio are both classed among the less infectious diseases, scarlet being only a fourth as infectious as measles, and polio only a fifteenth as infectious as scarlet. The author then extends his findings to all infectious diseases, and suggests that immunity to the less infectious diseases like the two mentioned, indicates a natural immunity to the more infectious diseases also.

In the case of measles patients, the susceptibility to diphtheria was only 10 per cent. higher than the normal, which was to be expected, since practically all children are susceptible to measles (about 96 per cent.).

The article appears in *American Journal of Diseases of Children*, March, 1917.

Twenty-Five Cents a Day for Food.—The recent increase in the prices of food-stuffs has stimulated a number of experiments aiming to show the possibilities of low-priced diets. Not the least interesting of these is that of the Life Extension Institute.

In its Monthly Health Letter No. 34, the Institute describes the experiment, the purpose of which was that "of carrying to the people a clear message on these simple, fundamental principles of food values, of which so few housewives or others upon whom devolves the responsibility of feeding the family, have any adequate knowledge."

Twelve policemen from the Training School of the New York Police Department acted as subjects. Their average weight was 170 pounds, or 15 pounds heavier than the average man. Eugene L. Fisk, M. D., Medical Director, and Prof. Irving Fisher, Chairman of the Hygiene Reference Board of the Life Extension Institute, directed the experiment. The dietaries were planned with the coöperation of Prof. Mary S. Rose of Columbia University.

The food was purchased at retail, and while of the highest quality, was chosen with a view to selecting elements that counted most for the money, while at the same time contributing palatibility, wholesomeness and nutritional balance. Eggs, cabbage and lettuce were excluded, nut margarine (a wholesome and palatable butter made from peanut oil and cocoanut oil) was substituted for butter, and meat was served only once a day as a rule. Following is a sample menu for a day:

Tuesday, January 23d:

Breakfast—Oatmeal and milk, crullers, rolls and nut butter, coffee.

Luncheon—Potato soup with carrots, rye bread and nut butter, stewed prunes and ginger snaps, tea.

Dinner—Parsnips, baked with sausage, samp, whole wheat bread with nut butter, bread pudding, fruit sauce, tea.

The experiment is said to have been completely successful in that the men were maintained in excellent physical condition, the menus being so satisfactory and appetizing that overeating resulted and there was a gain of 29 pounds in the weight of the group as a whole. Further, the blood-pressure of the group, which at the start was 5 mm. above the normal, was reduced to exactly normal at the end of the three weeks.

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* Editoral Note.—It is well to bear in mind that with the Schick test, a positive reaction indicates *susceptibility* to diphtheria, while, on the other hand, a positive typhoidin reaction indicates *immunity* to typhoid.

The cost was 25 cents for 3,500 calories, and as the average requirement of a business man of 155 pounds is said to be about 2,500 calories, the experimenters state that the latter could probably be fed for 20 cents per day, or less, and still be well nourished.

It is admitted that the average housewife, untrained in dietetics, on attempting to feed her family on 25 cents per individual daily would be in great danger of feeding them improperly; however, it is claimed that the necessary knowledge is easily acquired if one will put the mind upon it. A description of the experiment, together with a clear exposition of the simple principles of dietetics for use of the housewife is offered by the Life Extension Institute for ten cents. It is advised that where means permit, more milk, eggs, green vegetables and fresh fruit be used, especially where there are growing children, although for adults the menus suggested would furnish a proper amount of protein, fuel foods, minerals and vitamins.

The recommendations of Fisher and Fisk are attacked by Lawrence Irwell in the *Medical Times* for March, 1917. His very caustic article claims that vegetable protein will not take the place of animal protein, and that the excess of peas and beans would cause flatulence. The low quantity of bulky foods, like carrots and turnips would promote constipation, and the limited cost would prohibit a sufficiency of the vitamin furnishers, such as fresh fruits and vegetables.

✠

A Typhoid Carrier for 55 Years.—What appears to be the longest persistence of the typhoid carrier state ever noted, is reported in the *Zeitschrift für Hygiene* (V. 80, No. 3), by Dr. Hans Martz.

During 18 months prior to June, 1913, eight cases of typhoid of mysterious origin occurred in the Basle City Hospital. The inmates and attendants were examined, and of 72 Widals, sixty were negative and eight positive, and four suspicious. Of the 72 stools, 71 were negative for B. typhosis, and one positive. Further investigation showed that this case was responsible for the eight cases of typhoid.

The carrier was a demented woman 75 years old. Inquiry showed that she had had typhoid 55 years previously, in the course of an epidemic in 1859. Her urine was negative for the typhoid bacillus, although her stools were positive.

No direct proof exists that the carrier state persisted for half a century, but in view of proof by bacterial control that the condition has lasted 10 years in other instances leads the author to infer the long duration in the present instance. When the usual prophylactic measures were followed (cleanliness, disinfection of stools, barring from food handling and the use of common toilets, etc.), no more cases occurred in the Basle Hospital.

The author believes that the Widal is a valuable aid in the detection of carriers. He finds also that the excretion of bacilli is intermittent (schub-weise), and that at least three examinations are advisable before pronouncing a negative. The use of purgatives favors the appearance of the pathogen in the stool. Periodic bowel disturbances—diarrhea alternating with constipation—is believed characteristic of the carrier state.

No method of clearing up the carrier condition is known.

✠

Housing and Tuberculosis.—In the *Journal of the Outdoor Life* for February, 1917, Mr. Seymour H. Stone, Secretary of the Boston Association for the Relief and Control of Tuberculosis, discusses "House Infection and the Spread of Tuberculosis."

Mr. Stone cites several familiar investigations which show that many cases have probably been contracted from infected houses. Notable among these citations is the study made in Philadelphia under the direction of the Phipps Institute, by Dr. Frank A. Craig. In conclusion, Dr. Craig states that from their studies one might be led to the conclusion that house infection was a prolific source of danger. He does not, however, believe this to be the case.

Other factors in the spread of the disease, such as the environment and habits of the individual, are considered. In this connection Dr. Charles J. Hastings of Toronto is quoted as follows:

"People live in poor houses because of cheaper rent, and when it is necessary to cut down the rent it is usually necessary to cut down the other necessaries of life, such as fuel supply, food supply, clothing, etc."

Various references are given to show that the bacilli lose their virulence within ten days and the length of life of the tubercle bacillus is very short.

Mr. Stone's conclusions follow:

"In closing let me say that from a study of the material which I have presented I think we are warranted in drawing the following conclusions:

"1. While there probably is such a thing as infected houses, such houses, comparatively speaking, are not a source of great danger. Virile germs have been found in houses, but there seems to be a doubt in the minds of many as to whether such germs would find it easy to enter the human system.

"2. We need evidence that all other causes contributing to infection have been eliminated, such as working conditions, overcrowding, kind and amount of food, lack of light, air, and sanitation, wages, bad habits, etc., before we can charge up infection to the house. So far, I have not been able to discover any such evidence in any given case.

"3. Many experiments with tubercle bacilli would seem to indicate that they lead a comparatively short life, their virility diminishing rapidly, though there are, of course, some instances that point to the contrary.

"4. We seem to have pretty conclusive evidence that infection by fresh living bacilli through droplets and direct contact is probably the source of a very large proportion of cases, percentages ranging from 50 to 95 per cent. If these percentages are correct is it not further evidence that house infection does not very often occur?"

✣

The Clarification of Milk.—E. G. Hastings, Madison, Wis. (*Journal A. M. A.*, March 24, 1917), speaks of the clarification of market milk as one of the important developments of late years in the industry. There is a certain amount of insoluble dirt in every natural milk, the grosser parts of which are removed by strainers of cloth and wire. With the advent of the milk bottle, sediment which formerly passed unnoticed has become evident and means of removing it are called for. The introduction of the clarifier, a machine in which centrifugal force is applied to the milk to remove materials which would settle through force of gravity, has caused clarification to be looked on with favor by the milk dealers and has been demanded by ordinances in some communities. Hastings briefly reviews certain papers by McClintock and Hinkleman which have been largely used to support the demand for clarification, and also quotes others by Bohlmann and Hammer which favor the opposite view, and says that in general the results of careful workers indicate that the bacterial content is apparently increased considerably. "There is, of course, an actual decrease in case the contamination from the machine does not exceed the number of bacteria present in the slime removed by the process. The increase is an apparent one due to the breaking up of clumps of bacteria in the milk and therefore an increase in the number of colonies on the plate cultures. The important point is that the clarification process has no favorable effect on the keeping quality, and there is no reason to believe that such a proportion of harmful kinds of bacteria is removed that the healthfulness of the milk can be said to be improved." One of the most interesting statements made by the advocates of clarification is that the process removes the disease producing bacteria because their toxins make them heavy. Frankly stated, the process provides a way in which the dirty milk can be sold without the knowledge of the customers. The introduction of pasteurization, which has been opposed by some because it enables the dealer to handle a poorer quality of milk than he otherwise could, is, admitting this, a safety first method as producing a safer and better keeping quality than that of the raw milk.

✣

A New Type of Trickling Filter.—The *Journal of The Royal Sanitary Institute* for December, 1916, describes a new method of trickling filter construction. The author of the article, Lieut.-Col. G. G. Nasmith, C. M. G., Ph. D., is Director of Laboratories, Department of Public Health, Toronto, Canada, in which city the new construction has been tried out.

The trickling filter and the recent activated sludge method are considered the only methods of sewage treatment which successfully take advantage of the oxidizing properties of living microörganisms.

Experiments were begun in 1912 to reduce the estimated cost of filter-beds in Toronto. Greater surface of the filter per cubic yard and freer circulation of air in the bed were sought for. Ordinary wooden laths were used. The laths of the lowest layer were laid parallel to one another, the spaces between the laths being a little less than the width of the laths themselves. A second layer was laid on top of this and at right angles to it, with the same interspace. A third row was laid parallel to the bottom row, but in such a manner that the laths covered the spaces left between the laths of the lower series. In this way a filter four feet in depth was constructed, in which the sewage in order to reach the bottom had to flow over a very large surface of filter. Air could enter from all sides and the top.

The filter was mature in less than a month. This lath-filter was found to treat six million gallons of sewage per acre per day, yielding a non-putrescible effluent, while a standard type of stone filter, operated side by side with it as a control, treated two million gallons only. Satisfactory results are still being obtained after three and a half years of continuous service.

Slabs of wood were also experimented with but were discarded, as it was only possible to treat three and a half million gallons per acre per day.

Bundles of brushwood have been found to make a successful filter. The old revolving distributing sprinkler is used and the same rate of treatment is obtained with brushwood as with the lath-filter.

As the wood is always covered with slime and is continually soaked, no decay takes place.

Because of its cheapness and efficiency the brushwood filter is especially recommended.

⁂

Sanitary Drinking Fountain Attacked.—Our attention is again called to the sanitary drinking fountain by article appearing in the March issue of the *Journal of the American Water Works Association.*

The author, Mr. J. H. Dunlap, observes that most so-called sanitary fountains are little better than the old public cup. The fountain is reprehended for two reasons: First, it is constructed with too much confidence in the intelligence of the public; and second, it is made with too little attention to the laws of hydraulics.

"The average individual in drinking from public fountains will not hesitate to adjust the height of the jet of water so that his lips may conveniently rest upon the metal of the bubbler. The valves should be so made and the regulating devices so designed that the jet will rise to such a height as to make contact with the metal impossible." Six out of thirty-nine manufacturers equip their fountains with guards to prevent mouth contact with the bubbler.

It is further stated that bacteria obey the same law that is observed when one sees a ball dancing in the jet of a public fountain, and that they often remain in the jet for an indefinite length of time.

The results of the experiments, by which the sanitary fountain with the vertical jet was discredited at the University of Wisconsin, with their accompanying conclusions are set forth in the article.

⁂

Handling the Kickers.—The journal last cited above prints a paper by Earl T. Kirkpatrick on, "Experience in Handling Bad Water Complaints and Laboratory Control."

The majority of complaints are said to come from the users of water from dead ends where the water has acquired a slight taste or odor from some harmless microscopic growth or mineral.

A plan, for the curtailment of water waste caused by unnecessary blow-offs of dead ends, and the education of the public in some matters relating to the sanitation of water, is described.

When a complaint comes in it is at once referred to the laboratory and an inspection is made. Dissolved iron is found to be the chief cause of dissatisfaction. Only in the event of a great amount of iron is the end of the main blown off but in every case effort is made to explain the existing situation to the satisfaction of the complainant and he is made to feel that his interest and coöperation are appreciated.

The chronic kicker seems to lose interest in his self-appointed task when he is encouraged to continue his good work.

Public Health Activities in the Southern States.—The present status of public health activities in the Southern states, with suggestions for increased efficiency, is described by Dr. W. S. Leathers, Director of Public Health of Mississippi, in the *Southern Medical Journal* for March, 1917.

The laboratory is regarded as a corner stone in public health organization. Practically all of the Southern states maintain laboratories and efficient work is being done.

Vital statistics do not as yet command the important place in health work in the South which they should. At present only five Southern states are included in the registration area.

Past experience has shown that the proper sanitation of towns and cities is more quickly secured when the work is done under the supervision of the state board of health. The author deems it necessary for each state board of health to have a sanitary engineer who shall advise and pass on all plans for the protection of water supplies, and also on the architecture of buildings of public utility.

Owing to the large per cent. of rural population, special consideration is due this class of people. The "intensive method of health work" is recommended. This plan, with some of the excellent results obtained, is cited in the article.

Several Southern states have been conducting successful educational campaigns in health work but greater efficiency and greater expansion of the propaganda are urged.

Health activities are increasing in popularity among the masses and this is considered by the writer to be the best index of the great progress of health organization and activities in the Southern states.

A division of child hygiene, and a bureau of communicable diseases with a competent epidemiologist in charge are needs of each department of health.

Doctor Leathers states that while the malaria index has been reduced in many municipalities, it is actually increasing in many rural districts. The forces and conditions causing this disease are at present more than balancing the agencies employed for eradication.

Industrial Hygiene and Sanitation.

Women in Industry Abroad.—A recent report entitled "Labor, Finance, and the War" represents the results of a study carried on under the direction of the British Association for the Advancement of Science, and deals with the effect of the war on the industrial conditions of Great Britain. One chapter is devoted to the subject of the replacement of men by women in industry during the war, down to April, 1916. Over half a million women were added to the ranks of labor between the outbreak of the war and the spring of 1916. In mid-April, 1916, the number of women employed was 5,490,000. It is estimated that in April, 1916, there were 523,000 women directly replacing men and 737,000 replacing men either directly or indirectly. The instances in which women are found completely to be replacing men on skilled work are very few. It is interesting to note that the general opinion of the employers bears out the accepted view that women are lacking in the higher industrial qualities but excel in deftness of touch and in continued application to a routine operation. These results, however, are not very conclusive since the opinion came in great part from employers of women who had received only a minimum education. The general opinion is that women, particularly if married, do not take kindly to night work, and that their output is less by night than day. Men generally earn more than women but there is a greater correspondence between the wages earned by the two sexes for the same work. The question of women in industry after the war is as yet largely a matter of speculation. A great deal depends upon the action of the trade unions. A summary of conclusions arrived at in this interesting report can be found in the March number of the *Monthly Review of the U. S. Bureau of Labor Statistics*.

The *Review* also contains a brief article which deals with the employment of women and boys in munition works in Italy. The under secretary for arms and munitions issued two circulars during the latter part of 1916 in which he urged a greater employment of women in such works.

It appears that in Italy the employment of women in munition factories has met with passive resistance in some districts on the part of the employers, in others on the part of the workmen, or, owing to prejudice and traditional notions, on the part of the women themselves, whose aversion has been unmistakable and persistent.

*

"Maintaining Interest in Accident Prevention" is the title of an article in the February issue of *Safety Engineering*. No one interested in the "Safety First" movement can afford to miss the article unless he personally attended the general round table discussion at the Fifth Annual Congress of the National Safety Council. The round table discussion reported on in detail in this article was participated in by representatives of large industrial concerns and each representative had something of practical value to report.

*

"Labor Laws and their Administration" is the title of Bulletin number 211 recently issued by the U. S. Bureau of Labor Statistics. In it are discussed industrial and labor conditions, state activities regarding unemployment, the worker and his wages, woman labor, child labor, mediation in labor disputes, the safety of the worker, the health of the worker, accident compensation, and the organization of administrative agencies.

*

Safety Work Must Become More Definite and Democratic.—The March *Safety Engineering* editorially comments on the views relative to the safety movement as recently expressed by Mr. A. B. Jones, Director of Plant Administration of the B. F. Goodreich Co., Akron, O. The points emphasized by Mr. Jones are so pertinent that we have reproduced them here in part, through the courtesy extended by *Safety Engineering*.

"Industry," states Mr. Jones, "must consistently endeavor to promote the safety of all who are employed in the common service of production. The 'Safety First' movement is an attempt to prevent all accidents. The first few years of its life have naturally been spent in experimentation and in safeguarding the most obvious sources of injury. Only now are we beginning to reach a point in our knowledge where we can definitely plan campaigns that will effectively conserve the life and limb of all engaged in manufacture.

"Accidents have already been greatly reduced both in number and in severity. But preventable accidents still occur. Our limited success in the past makes our conviction the more sure that all accidents are preventable, and that their presence in any factory is a challenge to the intelligence of the management and the men. In the future, every manufacturer must work more definitely along two lines:

"(1) *He must see to it that machines are properly safeguarded at the time of purchase.* I believe that the time will come when industrial concerns will make the matter of adequate safeguards a requisite in the purchase of machines equally important with the consideration of price and general utility.

"(2) *The movement must be made sufficiently democratic to arouse the enthusiasm of the employes,* and to make them gladly assume their full share of responsibility for accident prevention. Methods for doing this will vary under the different systems of industrial management. Whether it be done through shop committees or a centralized executive staff making full use of educational bulletins, lectures and house publications, is only relatively important; the great essential is that it be done.

"Accident prevention is but one phase of the general problem of industrial relations. Safety work must be intelligently coördinated with health work, and with the effort continually to adjust labor grievances and to improve labor conditions. Business can succeed only by securing the good will of the consuming public through the intelligent and enthusiastic coöperation of all who serve it. Prevention of accidents, the conservation of health, the promotion of efficient workmanship and right living pays, in a commercial sense, since they are fundamental factors in securing the good will and the full productivity of the workers and thereby contribute directly to the success of the organization."

*

Workmen's Compensation Laws Upheld.—Any question as to the right of the states to enact workmen's compensation laws has been permanently settled by the recent decision of the United States Supreme Court. Not only has the right and power of the state to enact such legislation been affirmed, but the three leading types of workmen's compensation legislation have also been declared legal. In Iowa, the law is elective, both employer and employee being at liberty to elect whether to work under the statute or under the common law principles regulating relations between employer and employee. But inducements are offered to the employer to come under the law by specifically removing the three common law defenses, namely, the fellow servant doctrine, the voluntary assumption of risk on the part of the employee, and contributory negligence on the part of the injured person; while it also offers inducements to the employee in the form of a fixed schedule of compensations for injuries in place of the uncertainty of a jury verdict or a court finding. The New York law is essentially compulsory, but allows the employer to carry his own risk or to insure in either a private insurance company or a state fund; while the Washington law is not only compulsory in its application, but much broader in its provisions, including domestic and farm laborers as well as industrial employees, and requiring all employers to insure in the state fund without admitting private companies in any way. All three of these laws were before the court for review, and they were all sustained so far as constitutionality is concerned. This decision settles the right of the state to enact workmen's compensation laws in any of the three forms which were before the court. The interest of physicians, therefore, will hereafter center in the securing of equitable terms and conditions for medical services.—*Journal of the American Medical Association*, March 24, 1917.

⁂

Child Labor and the War.—The Thirteenth National Conference on Child Labor closed its sessions at Baltimore with conviction firmly established that whatever war measures this country is obliged to adopt there should be no let down in the standards for child protection. Time and again this note was struck as Julia C. Lathrop, Dr. Stephen S. Wise, Dr. Felix Adler, and Owen R. Lovejoy pointed out the vital necessity of continuing all efforts to further our American democratic ideals even if at the same time this country must take part in the fight for world-wide democracy. The lowering of standards abroad was used by Miss Lathrop and Mr. Lovejoy as an illustration of the fact that the excitement of war is fatal to the training and development of the younger generation and that social advance is retarded when childhood is impoverished. Dr. Felix Adler spoke of the fact that the tide of democracy is rising in Europe and that the people there will turn to us for help in the solution of their problems of free government. "In some respects we can confidently point to our example," said Dr. Adler, "but do we want Russia to adopt along with other institutions our system of child labor?"

The rest of the sessions were devoted largely to a discussion of the measures for which the federal child labor law has paved the way. Enforcing officials, Hon. John Price Jackson, of Pennsylvania, and Hon. Charles J. Fox, of Maryland, expressed their satisfaction that the federal law would reach some obstinate forms of child labor that the states had not been able to handle—the canneries of Maryland, for instance—and that the coöperation of state and federal enforcing officials would lead to a much more thorough enforcement of child labor laws, and Miss Lathrop, after explaining the steps that had been taken for the administration of the law said she believed the federal statute would greatly stimulate legislation in the states.

Forms of child labor that are to be found in every state in the Union and yet will not be touched by the federal law were discussed at some length. The use of children in the making of motion picture films was described by Miss Jeanie Minor of the New York Child Labor Committee as a form of child employment in need of nation-wide regulation. Following an investigation of the kind of work these children are called upon to do, New York passed a law forbidding their employment without a permit. As a result the producing companies are moving their studios to New Jersey where there is no regulation. At the session devoted to the agricultural problem, Mrs. G. H. Mathis, Field Agent and Agricultural Lecturer of the Alabama Bankers' Association, said the trouble in the South was that the farmers were so hopelessly poor they were obliged to use their children. The solution, she felt, lay in teaching these people how to run their farms so as to make them pay and then the children would be sent to school. Dr. Edward N. Clopper, of the National Child Labor Committee, spoke of the agricultural problem as the illusion of the near—so near to us that we are unable to see it.

Other ways for making the world a better place for children were suggested by C. C. Carstens, of Boston, and Roy Smith Wallace, of Philadelphia, who advocated the codification of all child welfare laws in order to avoid the present confusion and duplication, and by Dr. John Dewey and Hon. P. P. Claxton who emphasized the need of federal aid to elementary education as a means of equalizing the educational opportunities of children throughout the country.

⁂

Medals for Safety Work.—Arthur Williams, president of the American Museum of Safety, announced on March 16 the winners of four of the five gold medals awarded annually to firms or corporations that have done most to forward industrial safety. The E. H. Harriman memorial medal, which is given to the railroad that has the best year's record, is to be awarded later.

The Anthony N. Brady medal for the American electric railway which has done most to conserve the health and safety of its employes and patrons, was assigned to the Connecticut Electric Railway of New Haven. This company operates its road through more than a dozen cities, including Bridgeport, Waterbury, and Hartford, where traffic has been complicated by the influx of munition workers.

For a device which will greatly reduce the chances of coaches telescoping, the *Scientific American* medal was given to the Pullman Company. The Louis Livingston Seaman medal for progress in the promotion of hygiene and mitigation of occupational diseases, goes to the Julius King Optical Company, New York. The Travelers Insurance Company's medal for protecting the lives of workers is bestowed upon the Commonwealth Steel Company of St. Louis. —*Safety Engineering*, March.

⁂

Following the Example set by other countries with progressive tendencies as to labor legislation, the Hungarian Parliament, on March 19, 1916, enacted a law making it obligatory for large cities and communes to maintain public employment offices. The law provides for the granting of subsidies from the state budget.

⁂

The Monthly Review of the U. S. Bureau of Labor Statistics (March, 1917) contains an article on "Government Control of Food Supplies in European Countries" which is of great timely interest. It is a summary of the measures as to food control taken by the Bristol government. Like measures of other governments will be summarized and published in the *Monthly Review* for April.

⁂

The Ford Motor Company of Detroit, Mich., publishes a monthly bulletin for the benefit of the employees. These bulletins serve the purpose of acquainting the employee with the nature of the welfare work carried on by the company. There are chapters on Health, Safety First, Legal Aid, Banking, and Home and Library. Suggestions are welcomed and adopted if feasible. Those whose suggestions have been adopted are credited and put on the Honor Roll.

⁂

One Hundred Girls and Women of the H. D. Lee Mercantile Company, employed in the garment factories in Kansas City, have recently been clothed in overalls, as a precaution against accidents. The plan was adopted on the suggestion of the insurance agency, of which the Lee company is a client.

⁂

The National Safety Council will hold the Sixth Annual Safety Congress in New York City commencing Monday, September 10. The American Museum of Safety and the National Safety Council will hold a conjoint exhibit of safety devices.

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For the Comfort and Convenience of employees the National Cash Register Company at Dayton, Ohio, supplies employees during stormy weather with umbrellas and rubbers free of charge. Both must be returned not later than the following work day.

The Chicago Medical Society has issued a pamphlet condemning in no uncertain terms compulsory health insurance, and urges the Illinois Legislature to kill the bills now before it which have been drafted by the American Association for Labor Legislation.

*

The National Association of Manufacturers has appointed Mr. Carl M. Hansen, well known to the "Safety" world through his activities in the field of accident prevention, compensation and casualty insurance, to the chairmanship of the Association Committee for Accident Prevention and Workmen's Compensation. For some time, Mr. Hansen has been managing director of the Pennsylvania Mutual Liability Association. He is the author of "Universal Safety Standards" a work of thirteen volumes.

*

After Many Months of Analyzing and collating the circumstances of a very large percentage of the fires which occurred in New York during 1915, the Actuarial Bureau of the National Board of Fire Underwriters, has ascertained the causes of these fires, with their relative losses. The detailed figures can be studied in the February *Bulletin* of the American Museum of Safety. Among the "Strictly Preventable Causes" defective chimneys and flues figured as 4.1 per cent. matches as 4.3 per cent., smoking (cigars, cigarettes, pipes) as 4 per cent., and stoves, furnaces, boilers and their pipes as 4.3 per cent. Of "Partly Preventable Causes" exposure ranked highest with 14.3 per cent. Fires due to "Unknown Causes" amounted to 46.5 per cent. of the total and entailed a loss of $9,346,286. A loss of $4,358,618, is to be charged up to "Strictly Preventable Causes."

*

The "Safety" First Movement is strikingly brought out in Illinois statistics where the number of accidental deaths by railways and electric lines during 1916 have been reduced by 286 and the number of persons injured by 1,489.

*

The Ontario Safety League published their third annual report, constituting a brief statement of the fire and accident prevention campaign conducted during the year 1916. The league is very active. Its work includes the presentation of motion pictures, the distribution of school bulletins, industrial bulletins and letters to parents. The bulletins are snappy and highly instructive.

*

Dr. I. W. Ballantyne recently read a paper before the English Society for the Study of Inebriety, giving his own findings. They practically represent his whole life work—and quoting the experiments of Stockard and Papamiolaon upon alcoholized guinea-pigs. These experiments show that alcoholism in the parent does exert a baleful influence upon the germ cells, individually and collectively as the embryo and the fetur. Ballantyne concludes that alcohol is a danger to ante-natal health and a menace to antenatal life at every one of the stages of that existence and through each of the progenitors. This statement is of particular interest in view of the recent attempt to show that epilepsy, for example, is sometimes the result of impregnation at the time when both parents were alcoholized.

*

The Fourth Annual Report of the Department of Workshop and Factory Inspection of the State of Tennessee covers the work which has been done during 1916. Satisfaction is expressed with the rapid improvement of conditions. Most of the report is devoted to tabulated matter.

*

Safety Association Organized.—The Joseph A. Holmes Safety Association, made up of twenty-three societies, has been organized in Washington. Its objects are the betterment of mining conditions and of relations between operators and miners. The association will award annually one or more medals with honoraria, to be known as the Holmes Award, for the encouragement of more efficient safety devices, appliances or methods in mining, for personal heroism or for distinguished service or saving of life in any branch of the mining industry.—*Journal of the American Medical Association.*

Communications.

To the Editor:

In the issue of your Journal of December, 1916, there appears an editorial on bubble fountains based on the report of Pettibone, Bogart and Clark of an epidemic of streptococcus sore throat at the University of Wisconsin, probably due to bubble fountains. I presume that every one who has made a study of bubble fountains has recognized that they are possible sources of danger when they are badly constructed or when the stream is too low. This is especially true of some of those sold by large manufacturing firms where the outlet is surrounded by a cup several inches in diameter with only one or more small holes for drainage. Such a bubble fountain is practically impossible to keep clean.

These authors state that cultures introduced into the top of the stream remain there for a considerable length of time, 135 minutes in one case, and on an average of 25 minutes. The explanation given by them of their findings, namely, that the bacteria "dance" in the top of the stream much as a ball is supported by a jet, appears to be fanciful. If this is the explanation, then the remedy proposed, namely, the setting of the fountain at an angle, can not possibly be efficient. It is well known that a jet will support a ball even when that jet is set at an angle approaching 45 degrees, and furthermore, that the ball will be supported below the axis of the jet. This would seem to prove that the explanation given is not correct.

A Subscriber.

March 14, 1917

To the Editor:

In view of the appeals for thrift and economy now going over the country, may I venture to make a suggestion.

Why should we keep on talking, and writing, and printing, "infantile" paralysis when we can at one blow both economize and "strike ile"?

Some years ago it was almost universally customary to talk, write and print about "infantile" mortality, but time and attrition seem now to have wholesomely reduced this term to "infant" mortality.

Is it not about time for us to do the same for "infantile" paralysis? The words "infant" and "infantile" appear to be virtually synonymous, while to me "infantile" suggests retarded development rather than merely the period of infancy.

W. T. Sedgwick.

March 5. 1917.

Personal Notes.

Several research fellowships in the Department of Preventive Medicine and Hygiene at Harvard University are available for the scientific investigation of food poisoning. The work may at the same time be credited towards the Doctor of Public Health degree.

This investigation has been organized by the National Research Council, and the work has been intrusted to Professor M. J. Rosenau, of Harvard. The results of the research will be published through the regular scientific channels.

The National Research Council, acting under the advices of Dr. William H. Welch, President of the National Academy of Sciences, has named the following Advisory Commission to have supervisory charge of the investigation: Prof. John J. Abel, Johns Hopkins University; Prof. Reid Hunt, Harvard University; Prof. E. O. Jordan, University of Chicago; Prof. Lafayette B. Mendel, Yale University; Prof. Frederick G. Novy, University of Michigan; Prof. Eugene Opie, Washington University; Prof. H. Gideon Wells, University of Chicago. The expense of the research will be assumed by the National Canners' Association.

Candidates should apply to Dr. M. J. Rosenau, Harvard Medical School, Boston, Mass.

The Civil Service Commission of the State of New York announces examinations for the state, county, and village service to take place May 5, 1917, which include the following list of positions: Junior Assistant, Engineering Departments $900 to $1,200, men only; Assistant Bacteriologist, State Department of Health, men only, $1,800, minimum age 25 years; Assistant Bacteriologist, State Department of Health, open to men and women, $900 to $1,200, minimum age 21 years. Non-citizens and non-residents admitted to examination. All applications should be in the hands of the State Civil Service Commission, Albany, N. Y., by April 25.

*

The McGraw Publishing Company, Inc., and the Hill Publishing Company, New York, have been consolidated as the McGraw-Hill Publishing Company Inc. The new company acquires all the properties and interests of the two constituents, including the following technical journals: *Electrical World, Electrical Railway Journal, Electrical Merchandising, Engineering Record, Metallurgical and Chemical Engineering, The Contractor, American Machinist, Power, Engineering News, Engineering and Mining Journal, and Coal Age.* Two of these papers, *Engineering News* and *Engineering Record* will be consolidated under the name, *Engineering News-Record,* with Mr. Charles Whiting Baker, now editor of *Engineering News,* as editor-in-chief. Mr James H. McGraw will be president of the new company, Mr. Arthur J. Baldwin (now president of the Hill Publishing Company) vice-president and treasurer and Mr. E. J. Mehren, vice-president and general manager.

*

The National Research Committee has recently appointed Dr. F. P. Gay of Berkeley, Cal., a member of its committee on hygiene.

*

Dr. P. E. Blackerby has been appointed registrar of the State Board of Health of Kentucky.

*

A bill has been introduced before the Nebraska State legislature calling for the transference of the state bacteriological laboratory from the control of the State Board of Health to the control of the University College of Medicine at Omaha.

Under the leadership of the St. Louis Tuberculosis Society, the many organizations in that city interested in public health work are organizing the St. Louis Public Health Association, with the object of instructing the people in the prevention of disease.

*

At the recent elections of the Oregon State Board of Health, Dr. A. C. Seeley was elected president of the board, Dr. M. B. Marcellus vice-president, and Dr. D. N. Roberg, was reelected secretary.

*

Dr. J. M. Lowrey has been appointed health officer of Birmingham, Ala.

*

The Metropolitan Life Insurance Company on March 16, at their own expense, began a health survey of New Orleans, in coöperation with the Louisiana State Board of Health. The purpose of the survey is to determine the number of cases of disease in the city within a definite period and the nature of the care of those who are ill. Malaria is the first subject taken up.

*

Under the charge of Dr. A. P. Santry, a health clinic was recently opened in the city of Little Falls, N. Y., conducted by Miss Pearl N. Hyer, the city public health nurse.

*

Dr. Ludwig Hektoen of the University of Chicago, and Dr. M. H. Fischer and Dr. J. Eichberg, of the University of Cincinnati, have been appointed Cutter lecturers on hygiene and preventive medicine at Harvard University.

*

John Yates, secretary of the Associated Charities of Harrisburg, has been appointed secretary of the Associated Charities of Pittsburg.

*

Miss May Allison, formerly in charge of the Women's Educational and Industrial Union of Boston, has been appointed assistant secretary of the National Society for the promotion of Industrial Education.

*

Dr. H. L. Rockwood, formerly superintendent of the tuberculosis sanitarium of the Cleveland Department of Health, has been appointed chief of the Bureau of Tuberculosis of that city.

Dr. J. J. Galligan has been appointed assistant commissioner of health of Salt Lake City, Utah, to succeed Dr. T. J. Howells, who has resigned.

* * *

Dr. W. T. Burdick has resigned as city pathologist of Denver, Colo.

* * *

Dr. W. F. King has recently been elected president of the Indiana Sanitary and Water Supply Association. Doctor King is assistant secretary of the Indiana State Board of Health.

* * *

The following persons were elected to membership in the American Public Health Association, March 8, 1917:

Park B. Jenkins, M. D., Superintendent South Dakota State Board of Health, Waubay, S. D.

H. T. G. Naumann, M. A., City Chemist, Port Huron, Mich.

H. N. Calver, B. S., Laboratory Director, Winston-Salem, N. C.

Mr. Henry G. Parker, Brookline, Mass.

Sally E. Kutz, B. A., M. Sc., Instructor of Hygiene, Hunter College, N. Y.

John W. Plant, M. D., Michigan State Tuberculosis Survey, Lansing, Mich.

Mr. Roy R. Gockley, Instructor on Bacteriology, State School of Agriculture, N. Y.

W. P. Greene, M. D., Minneapolis, Minn.

B. A. Ledbetter, M. D., New Orleans, La.

A. T. McCormick, M. D., Bowling Green, Ky., Secretary, State Board of Health.

Prof. A. G. Woodman, Associate Professor of Foods, Massachusetts Institute Technology, Cambridge, Mass.

George S. Luckett, M. D., Washington, D. C.

S. N. Trockey, M. D., Chicago, Ill.

Talbot Reed, M. D., Health Officer, Atlantic City, N. J.

Mr. F. R. Georgia, Instructor in Chemistry, Cornell University, Ithaca, N. Y.

F. M. Routh, M. D., Greenwood, S. C.

I. B. Crilly, H. O., Altoona, Pa.

Mr. Jacob L. Crane, Jr., Assistant Engineer, State Board of Health, Lansing, Mich.

B. L. Schuster, M. D., Wilmette, Ill.

J. T. Howell, M. D., Health Officer, Hartsville, S. C.

G. McG. Stewart, M. D., United States Public Health Service, New Orleans, La.

Current Public Health Literature.

AMERICAN.

American City, New York.

XVI. March.

A New Method of Garbage Reduction. G. R. Tuska.
How Much Playground Space Does a City Need? Rowland Haynes.
Planning the Distribution of the Water Supply of a Small Town. M'Kean Maffitt.

American Food Journal, Chicago.

12. March.

Food Manufacture and the Law. T. E. Lannen and T. J. Hickey.
Bacteriological Study of Hamburger Steak. Edwin LeFevre.
Manufacture of Commercial Yeast.
Fermentation. G. L. Teller.
Laboratory Control of Yeast Making.

American Journal of Diseases of Children, Chicago.

13. March.

Cerebrospinal Fluid in Poliomyelitis with Special Reference to Longe Reaction. P. C. Jeans, M. R. Johnston.
Schick Test in Poliomyelitis, Scarlet Fever, Measles, and in Normal Children. A. Zingher.
Progress in Pediatrics. Résumé of Work on Tuberculosis in Children for 1916. May Micheal.

American Medicine, New York.

90. February.

Tuberculosis in Great Britain at War. H. G. Sutherland.
Brief Study of Poisonous Insects. R. I. Grare.

American Labor Legislation Review, New York.

VII. March.

The Need for Health Insurance. Irving Fisher.
Public Protection of Maternity. Julia Lathrop.
Medical Organization under Health Insurance. Alex. Lambert.
Health Insurance through Local Mutual Funds. I. M. Rubinow.
Fraternal Societies under Universal Health Insurance. J. J. Lentz.
Establishment Funds and Universal Health Insurance. E. N. Huyck.
Trade Union Sick Funds and Compulsory Health Insurance. Wm. Green.
Principles of Health Insurance. M. M. Dawson.
Eight-Hour Shifts by Federal Legislation. J. R. Commons.
Eight-Hour Day and Six-Day Week in Continuous Industries. W. D. Dickson.
One Day of Rest in Seven by State and Federal Legislation. J. A. Fitch.
Report of Work, 1916. John B. Andrews.

Boston Medical and Surgical Journal.

CLXXVI. March 8.

Inebriety and How to Control It. I. H. Neff.

March 15.

Study of the Problem of the So-called Defective Delinquent and What Has Been Done in Massachusetts. L. V. Briggs.
What the State is Doing for the Syphilitic at the State Infirmary at Tewksbury, Mass. Miss Ora M. Lewis.
Argument in Favor of Senate Bill No. 135, before the Joint Committee on the Judiciary, by Committee on Workmen's Compensation of the Massachusetts Medical Society.

March 22.

The Neurologic Aspects of Food Poisonings. A. W. Fairbanks.
Feeble-mindedness as Seen in Court. V. V. Anderson.
The Proposed Health Insurance Legislation. F. W. Anthony.
A Wise Preliminary to the Adoption of Any Compulsory Health Insurance Act. E. A. Codman.

Bulletin of the Johns Hopkins Hospital, Baltimore.

XXVIII. March.

Observations Bearing on the Possibility of Developing an Experimental Chemotherapy. P. A. Lewis.

Industrial Management, New York.

LII. March.

Some Experience with Profit-sharing. Dwight T. Farnham.
Correct Working Methods. G. H. Shepard.
Hiring the Worker. R. W. Kelly.

Journal of the American Medical Association, Chicago.

LXVIII. February 24.

Colon Bacillus Pyelonephritis. E. G. Crabtree and Hugh Cabot.
Human Anthrax: Report of an Outbreak Among Tannery Workers. W. H. Brown and C. E. Simpson.

March 3.

Certain Aspects of Natural and Acquired Resistance to Tuberculosis and Their Bearing on Preventive Measures. Theobald Smith.
Etiology of the Epidemic Acute Respiratory Infections Commonly Called Influenza. George Mathers.
Trichinae in Pork and Nematodes in Butterfish and their Relation to the Implied Warranty in the Sale of Articles of Food. C. W. Stiles.
Analine Poisoning. H. G. Bugbee.

March 10.

Certain Aspects of Natural and Acquired Resistance to Tuberculosis and Their Bearing on Preventive Measures. (Cont.) Theobald Smith.
Comparative Study of Thick and Thin Blood Smears for Diagnosis of Malarial Fevers. H. A. Taylor.
Syphilis as an Etiologic Factor in Mongolian Idiocity. J. E. McClelland and H. O. Ruh.
Note on the Bacteriology of the Spinal Fluid in Poliomyelitis and Scarlet Fever. Harry Gauss.
Isolation of the Typhoid Bacillus from Duodenal Contents, Obtained by Einhorn Tube. F. M. Durham.

March 17.

Community Treatment of Malaria. A. J. Ochsner.
The Pneumococcus Found in a Case of Stillbirth. E. L. Cornell.
Typhoid in the Large Cities of the United States. Fifth Annual Report.

March 24.

A Health Examination at School Entrance. W. H. Burnham.
The Clarification of Milk. E. G. Hastings.

Journal of the American Water Works Association, Baltimore.

4. March.

Protection of the Watershed of the Newark Water Works. M. R. Sherrerd.
Sanitation of the Croton Watershed. T. D. L. Coffin.
Sanitation of the Rockaway River Watershed. C. F. Breitzke.
Sanitation of Watersheds. Discussion.
Electrolysis. Discussion.
Some Observations upon Public Regulation of Waterworks. Leonard Metcalf.
The Sioux City Booster Station. Philip Carlin.
Experience of Handling Bad Water Complaints and Laboratory Control. E. T. Kirkpatrick.
The Sanitary Drinking Fountain. J. H. Dunlap.
Treatment of Missouri River Water at Council Bluffs, Iowa. J. B. Thornell.
Some Problems of the Waterworks Executive. G. O. House.
Swimming Pool Operation. J. J. Hinman, Jr.
Water Supply of the Quad Cities. M. R. Carlson.
An Inverted Siphon in a Suction Line. K. C. Kastberg.
The Use of Water Meters. J. C. Beardsley.

Journal of Infectious Diseases, Chicago.

20. March

Tuberculin Hypersensitiveness as Determined by Intracutaneous Tests of Different Degrees. M. Solis-Cohen.
Virulence and Toxic Formation in B. Diphtheriae. W. E. Cary.
Studies in Pneumonia: I, II, III, IV, V. Solis-Cohen, Kolmer, Heist and Steinfield.

Journal of Laboratory and Clinical Medicine, St. Louis.

II. March.

Spirochaetes. Hideyo Nogouchi.
The Effect of Certain Drugs upon Skin Reactions. Kolmer, Immerman, Matsunami, and Montgomery.
Distribution of Blood Sugar as Regards Corpuscles, Plasma, and Whole Blood in Health and Disease in Man. R. B. H. Gradwohl and A. J. Blaivas.
Construction of Clinical Laboratory Equipment. M. J. Brewer.
New Kind of Long Paper Kymograph. D. E. Jackson.
Rapid Examination of Occult Blood by the Benzidine Method. W. T. Vaughan.

Journal of Outdoor Life, New York.

XIV. March.

Outdoor Treatment for Defective Nutrition, The Story of an Experiment. E. F. Brown.
The Tuberculosis Class: An Experiment in Home Treatment. J. H. Pratt.

Medical Record, New York.

91. March 3.

Hospital Social Service for Children. H. D. Chapin.
Compulsory Health Service. E. V. Delphey.
The Problem of Medical Care of Five Million Individuals. A. C. Burnham.

March 17.

The Real Cancer Problem. L. D. Buckley.

Medical Times, New York.

XLV. March.

Living on 25 cents Worth of Food per Day. L. Irwell.
Health Insurance and the Physician. E. C. Bennett.
A Satisfactory Technique for Administration of Salvarsan and Neo-Salvarsan. H. S. Balsetel.
Advantages of Treating Colds with Vaccines. G. H. Sherman.

Medical Review of Reviews, New York.

23 March.

A Year of Pediatrics.
Conserving Health Versus Exploiting Disease. J. P. Warbasse.
On the Reporting of Venereal Disease. J. D. Robertson.
The Present and Future of Narcotic Pathology. Part III. Drug Addiction. C. B. Townes.

Military Surgeon, Washington, D. C.

XL. March.

The Influence of the European War on the Transmission of the Infection of Disease, with Special Reference to Its Effect upon Disease Conditions in the United States. W. C. Rucker.
Occurrence of Endamebic Dysentery in Troops Serving in El Paso District. C. F. Craig.
Demography in so Far as It Relates to the Vital Statistics of Armies. W. P. Chamberlain.

Modern Hospital, St. Louis.

VIII. March.

How Much Coal Does a Patient Cost? R. C. Beadel.
The Tuberculosis Preventorium for Children, Farmingdale, N. J. J. P. Quimby.
An Experiment in Coöperative Care for the Indigent Sick. W. B. Small.
Oleomargarine—A Useful and Economical Substitute for Butter. J. P. Street.

Municipal Journal, New York.

XLII. March 1.

Natural Purification of Water by Freezing. R. A. Whittaker.

March 8.

San Marcos Activated Sludge Plant. G. B. Zimmele.
Refuse Collection in Los Angeles. C. W. Geiger.

New York Medical and Surgical Journal.

CV. March 3.

Medical Department with the Mobile Army. W. H. Steers.
Report of One Year's Work in Tuberculosis. J. D. Gibson.

March 17.

The Medical Corps with the Navy. R. C. Holcomb.
Prevention and Treatment of Cancer Based Upon X-Ray Findings of Dental Infection and the Use of an Autogenous Vaccine. S. Tousey.

March 24.

The Bacteriology of Influenza. W. H. Park.
Local Vaccine. J. A. Pratt.

New York State Journal of Medicine.

17. March.

Typhoid Fever in Children. G. C. Sincerbeaux.
Health Insurance from a Public Health Viewpoint. Arthur Krida.

New Orleans Medical and Surgical Journal.

69. March.

Colonization of Epileptics. W. B. Terhune.
Agglutination of Bacteria by Means of Dried and Dosed Sera, with Special Application to the Diagnosis of Cholera. G. Marocco.

Northwest Medicine, Seattle.

XVI. March.

A Consideration of the More Obscure Causes of Infant Mortality. J. W. Amesse.
Relation of Pleurisy to Tuberculosis. A Study of Three Thousand Cases. E. A. Pierce.
Hygiene of Pregnancy. W. C. Heussy.

Safety-Bulletin of the American Museum of Safety, New York.

5. February.

Protection of Life a First Duty of a Government. F. R. Hutton.
Machine Shop Hazards. L. D. Burlingame.

Safety Engineering, New York.

XXXIII. February.

Saving Lives and Limbs of Workmen.
Maintaining Interest in Accident Prevention. Round Table Discussion.
Maximum Temperature in Which a Workman Can Work. F. L. Hoffman.
Fatality Rate in the Explosives Industry.
Hints for Industrial Safety Work. F. M. Coffey.
The Inspector's Plea to the Mine Worker. S. C. Reynolds.
Dangers of Infections. G. W. Bowie.

Social Hygiene, Baltimore.

III. April.

In Defense of Radicalism. D. B. Hooker.
The New Moral Viewpoint of the French Young Man. Jules Bois.
The Sword of Damocles. W. C. Rucker.
The Atlanta Campaign Against Commercialized Vice. Marion M. Jackson.
The Prophylaxis of Venereal Diseases. M. P. Ravenel.
Syphilis, A Disease of Diminishing Severity. Douglas Symmers.
Prostitution in Its Relation to the Army on the Mexican Border. M. J. Exner.
What England Is Doing for the Venereal Diseased.
Social Hygiene Legislation in 1916.

Southern Hospital Record, Atlanta.

3. February.

Community Survey and Preliminary Work in the Establishment of a Community Hospital. W. T. Graham.
How the Public Health Nurse Can Aid State Departments of Health to Extend Its Program of Health Conservation. (Cont.) R. G. Patterson.

Southern Medical Journal, Birmingham.

X. March.

Correlation of Laboratory and Clinical Teaching. George Dock.
Public Health Activities in the Southern States, with Suggestions for Increased Efficiency. W. S. Leathers.
Rôle of County Health Officer in Public Health Work. T. M. Dye.
Report of Committee on Standardization of the Scope of Laboratory Work in State Bacteriological Laboratories.
Health Insurance: Its Relation to the Medical Profession. B. S. Warren.

Survey, New York.

XXXVII. February 24.

Houses for Wage Earners. John Ihlder.
Untangling Pennsylvania's Hospitals. Neva R. Deardorff.
Turning Off the Spigot. VI. Is Beer the Cure for the Drink Evil. VII. The Case Against Beer. VIII. Prohibiting Distilled Liquors and Keeping Beer. Elizabeth Tilton.

March 10.

When Microbes Meet.
Turning Off the Spigot. IX. Do We Want the Gothenburg System? Elizabeth Tilton.

March 17.

The Machinery of Misery. Bruno Lasker.
A Reveille to American Industry. J. A. Fitch.

Trained Nurse, New York.

LVIII. April.

Infantile Hygiene During the Pre-School Age. Kate Lindsay.
The Movies and the Microscope. G. E. Barton.
A Fertile Field for the Nurse. Katherine E. Megee.
How Two Thousand Mothers were Cared for In Child Birth.
The Psychology of Nursing. Ottie A. Shearer.

U. S. Public Health Reports, Washington, D. C.

32. February 23.

Interstate Sanitary Districts.
Interstate Quarantine Regulations.
Aridity of Indoor Atmospheres in Winter.
Climate and Tuberculosis. J. W. Trask.

March 2.

Measures to Prevent Typhus Fever.
Public Health Administration. Paul Preble.

March 9.

The Activity of Wild American Digitalis. G. B. Roth.

March 16.

Rack and Disinfector for Clinical Thermometers. B. E. Holsendorf.

March 23.

Combating Typhus Fever on the Mexican Border. C. C. Pierce.

BRITISH.

Journal of State Medicine, London.

XXV. February.

The Principles of Organization and Administration in Child Welfare Work. J. E. Lane-Claypon.
Purification of Water in War Time. J. C. McWalter.
The Study of the Causes and Means of the Spreading of Infectious Disease. C. H. Stewart.
The Prophylaxis of Cerebrospinal Meningitis. H. Vincent.

Medical Officer, London.

February 10. XVII.

The Defence of "Warranty" under the Sale of Food and Drug Acts. A. M. Bramall.

February 17.

Some Administrative Aspects of Child Welfare Schemes in Scotland. Mary I. Menzies.

February 24.

War and National Welfare.
The Value of Tuberculin in the Treatment of Tuberculosis. M. Hay.

March 3.

Municipal Midwives.
Case Fatality in Typhoid Fever. A. W. Freeman.

Tropical Diseases Bulletin, London.

9. February 14.

Sanitation Number.

Applied Hygiene in the Tropics. W. G. King.
Disease Prevention.
Sanitary Organization.
Sanitary Rulings.
Treatment of Waste.
Sanitary Works.
Vital Statistics.

BOOKS AND REPORTS RECEIVED.

City Milk Supply. *By Horatio N. Parker. McGraw-Hill Book Co., Inc., New York. 1917. Illus. Price, $5.00 net.*

The Four Epochs of a Woman's Life. *By Anna M. Galbraith, M. D. W. B. Saunders Co., Philadelphia. 1917. Third Edition. Cloth, $1.50 net.*

Waterworks Handbook. *By A. D. Flinn, R. S. Weston, and C. L. Bogert. McGraw-Hill Book Co., Inc., New York. 1916. First Edition. Pp. 824. Illustrations and Tables. Price, $6.00 net.*

Newer Methods of Blood and Urine Chemistry. *R. B. H. Gradwohl, M. D. and A. J. Blauvais. C. V. Mosby Co., St. Louis. 1917. Illus. Pp. 226. Price, $2.50 net.*

Suggestive Therapeutics *By H. S. Munro, M. D. C. V. Mosby Co., St. Louis. 1917. Fourth Edition. Price, $5.00 net.*

Changes in the Pharmacopoeia and the National Formulary. *By Martin I. Wilbert. Bulletin No. 107 of the Hygienic Laboratory of the U. S. Public Health Service.*

I. Pituitary Standardization. II. Pharacological Studies with Cocaine and Novocaine. *By George B. Roth. Bulletin No. 109 of the Hygienic Laboratory of the U. S. Public Health Service.*

Studies in Pellagra. *By Sundwall and Francis. Bulletin No. 106 of the Hygienic Laboratory of the U. S. Public Health Service.*

Profit Sharing in the United States. *By Boris Emmet. Bulletin No. 208 of the U. S. Bureau of Labor Statistics.*

Vocational Education Survey of Minneapolis, Minn. *Made by the National Society for the Promotion of Industrial Education. Bulletin No. 199 of the U. S. Bureau of Labor Statistics.*

Eighth Annual Report of the Hebrew Sheltering and Immigrant Aid Society of America, New York City.

Eighth Biennial Report of the State Board of Health of Montana, 1915–1916. *W. F. Cogswell, M. D., Secretary.*

American Journal of Public Health
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A STATISTICAL STUDY OF DIPHTHERIA.

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Read before the Vital Statistics Section, American Public Health Association, Cincinnati, Ohio, October 27, 1916.

STATISTICS of diphtheria and croup are difficult to appraise for various reasons. This disease was for many years confounded with various other diseases, including scarlet fever, and its positive diagnosis in all cases was not possible until Klebs discovered the specific germ in 1883. Then, again, various terms were used more or less interchangeably for diphtheria for a long period previous to 1821 when the term *diphtheria* was first used by Bretonneau. Subsequent to 1821 croup, even of the membranous type, was separately reported in most of the registration offices of the world and this was continued until comparatively recent years.

Diphtheria as a cause of death was first so separately classified by the Registrar-General of England in 1855; it appeared for the first time in the New York City reports in 1857; and in the Massachusetts registration reports in 1858. In the Annual Report of the City Inspector of New York for the year ending December 31, 1860, the statement was made that "It (diphtheria) is not contagious. No reliable evidence has otherwise been given." (p. 244.) In this report the further statement was made that "It serves well as a cloak when the patient died of *croup* or *scarlet fever*, for our *panic-makers* have made the idea general that it is almost positively fatal, in most cases; hence, a death from it is regarded as a forecast result, and no fault is found with the attending physician."

Many experiments with the Klebs-Loeffler bacillus during the period 1883 to 1890, led to the discovery of antitoxin in the latter year, and this discovery led immediately to many controversies over the question of the merits of antitoxin as a curative agent. The use of antitoxin, however, was begun at once, notably in Germany and in New York City, and doubt as to its efficacy was quickly dispelled when the curative results began to be reflected in the decreased mortality among cases treated with the new remedy.

Because of the recent improvements in laboratory practice and the rapid extension of the application of scientific methods to the diagnosis of diphtheria it is quite impossible to compare the diphtheria morbidity rates of recent years with the morbidity rates of the pre-antitoxin or early antitoxin periods. In the comparative death-rates of this disease, however, we are on safer ground, for the cases of diphtheria and membranous croup which terminate fatally are more likely to be correctly certified than mild cases are likely to be correctly diagnosed.

In the years immediately subsequent to the discovery of antitoxin there was a lively controversy waged between those favoring and those opposed to its use. Today there are few physicians who would be bold enough openly to proclaim their opposition to the use of antitoxin, for such an expression of opinion would be a bad advertisement in any enlightened community. All diphtheria mortality statistics clearly indicate a decline in the mortality from this disease immediately after the use of antitoxin has become extensive in any given locality, city or country.

In Table 1 the comparative mortality from diphtheria and croup in pre-antitoxin and recent antitoxin periods is exhibited for twenty countries, in most of which the registration of vital statistics has presumably been fairly efficient throughout the periods to which the data relate.*

According to this table the average annual death-rate in the twenty countries combined was 16.3 per 100,000 of population during the antitoxin period,

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* See also Chart I, p. 447.

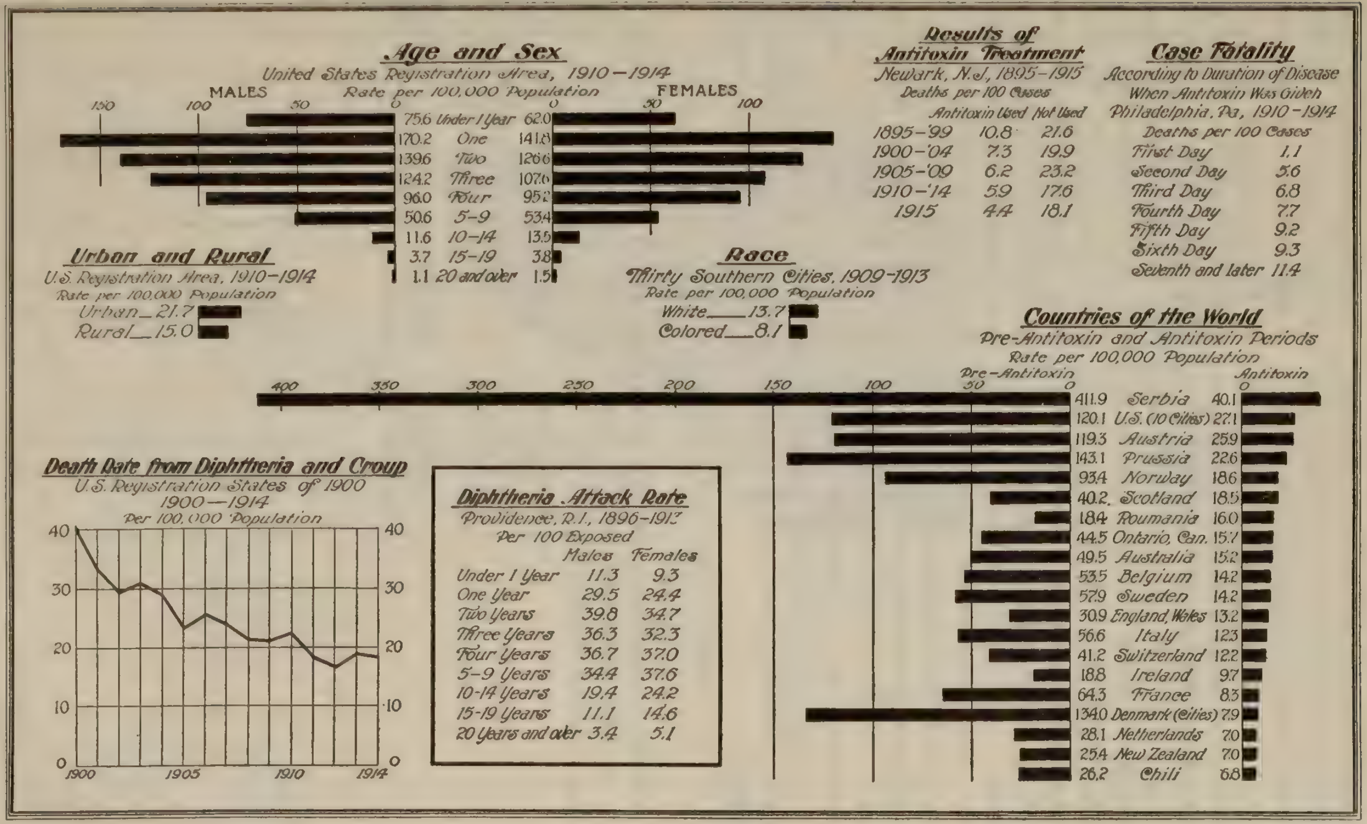
TABLE 1. MORTALITY FROM DIPHTHERIA AND CROUP IN TWENTY COUNTRIES.

Country.	Pre-Antitoxin Period.				Antitoxin Period.				Mortality Reduction.	
	Years.	Population.	Deaths.	Rate per 100,000 population.	Years.	Population.	Deaths.	Rate per 100.000 population.	Decrease in the rate.	Estimate of lives saved yearly.
Serbia	1892–96	11,383,189	46,891	411.9	1907–11	14,319,158	5,747	40.1	371.8	10,648
Ten cities of the United States	1889–93	34,048,719	40,877	120.1	1910–14	62,137,543	16,839	27.1	93.0	11,558
Austria	1889–93	119,900,414	143,090	119.3	1908–12	142,091,028	36,839	25.9	93.4	26,543
Prussia	1889–93	150,981,087	216,073	143.1	1909–13	202,402,338	45,723	22.6	120.5	48,779
Norway	1889–93	9,979,100	9,322	93.4	1909–13	11,872,500	2,210	18.6	74.8	1,776
Scotland	1889–93	20,213,621	8,120	40.2	1910–14	23,706,119	4,389	18.5	21.7	1,029
Roumania	1889–93	26,877,394	4,952	18.4	1910–14	36,340,027	5,799	16.0	2.4	174
Ontario	1889–93	10,747,138	4,778	44.5	1910–14	12,772,835	2,011	15.7	28.8	736
Australia	1889–93	15,932,362	7,889	49.5	1910–14	23,228,258	3,529	15.2	34.3	1,593
Belgium	1889–93	30,757,190	16,470	53.5	1908–12	37,323,929	5,307	14.2	39.3	2,934
Sweden	1889–93	23,955,210	13,860	57.9	1907–11	27,255,585	3,857	14.2	43.7	2,382
England and Wales	1889–93	145,479,965	44,933	30.9	1910–14	181,930,953	24,097	13.2	17.7	6,440
Italy	1889–93	152,276,502	86,138	56.6	1909–13	173,569,932	21,415	12.3	44.3	15,378
Switzerland	1889–93	14,897,082	6,131	41.2	1909–13	18,915,843	2,301	12.2	29.0	1,097
Ireland	1892–96	22,932,527	4,314	18.8	1910–14	21,914,149	2,117	9.7	9.1	399
France	1889–93	50,451,824	32,460*	64.3	1907–11	197,206,000	16,279	8.3	56.0	22,087
Denmark†	1890–94	3,843,185	5,151	134.0	1910–14	5,690,580	447	7.9	126.1	1,435
The Netherlands	1892–96	23,832,786	6,705	28.1	1910–14	30,394,016	2,115	7.0	21.1	1,283
New Zealand	1892–96	3,382,053	860	25.4	1910–14	5,205,686	362	7.0	18.4	192
Chili	1889–93	13,191,076	3,458	26.2	1910–14	17,526,572	1,198	6.8	19.4	680
Total		885,062,424	702,472	79.4		1,245,803,051	202,581	16.3	63.1	157,143

† Cities only.

CHART I.

Mortality from Diphtheria and Croup



Age and Sex

United States Registration Area, 1910–1914

Rate per 100,000 Population

MALES		FEMALES
75.6	Under 1 Year	62.0
170.2	One	141.8
139.6	Two	126.6
124.2	Three	107.6
96.0	Four	95.2
50.6	5–9	53.4
11.6	10–14	13.5
3.7	15–19	3.8
1.1	20 and over	1.5

Urban and Rural

U.S. Registration Area, 1910–1914

Rate per 100,000 Population

Urban__21.7

Rural__15.0

Race

Thirty Southern Cities, 1909–1913

Rate per 100,000 Population

White____13.7

Colored___8.1

Results of Antitoxin Treatment

Newark, N.J., 1895–1915

Deaths per 100 Cases

	Antitoxin Used	Not Used
1895–'99	10.8	21.6
1900–'04	7.3	19.9
1905–'09	6.2	23.2
1910–'14	5.9	17.6
1915	4.4	18.1

Case Fatality

According to Duration of Disease When Antitoxin Was Given

Philadelphia, Pa., 1910–1914

Deaths per 100 Cases

First Day	1.1
Second Day	5.6
Third Day	6.8
Fourth Day	7.7
Fifth Day	9.2
Sixth Day	9.3
Seventh and later	11.4

Countries of the World

Pre-Antitoxin and Antitoxin Periods

Rate per 100,000 Population

Pre-Antitoxin		Antitoxin
411.9	Serbia	40.1
120.1	U.S. (10 Cities)	27.1
119.3	Austria	25.9
143.1	Prussia	22.6
93.4	Norway	18.6
40.2	Scotland	18.5
18.4	Roumania	16.0
44.5	Ontario, Can.	15.7
49.5	Australia	15.2
53.5	Belgium	14.2
57.9	Sweden	14.2
30.9	England, Wales	13.2
56.6	Italy	12.3
41.2	Switzerland	12.2
18.8	Ireland	9.7
64.3	France	8.3
134.0	Denmark (Cities)	7.9
28.1	Netherlands	7.0
25.4	New Zealand	7.0
26.2	Chili	6.8

Death Rate from Diphtheria and Croup

U.S. Registration States of 1900

1900—1914

Per 100,000 Population

Diphtheria Attack Rate

Providence, R.I., 1896–1913

Per 100 Exposed

	Males	Females
Under 1 Year	11.3	9.3
One Year	29.5	24.4
Two Years	39.8	34.7
Three Years	36.3	32.3
Four Years	36.7	37.0
5–9 Years	34.4	37.6
10-14 Years	19.4	24.2
15-19 Years	11.1	14.6
20 Years and over	3.4	5.1

against an average rate of 79.4 during the pre-antitoxin period. This means that within a period of twenty-five years the mortality rate of diphtheria and croup in these combined countries has decreased 63.1 per 100,000 population, or 79.6 per cent. In these twenty countries combined the present annual saving of lives through the use of antitoxin and other improved methods of diphtheria diagnosis and treatment is more than 157,000 per year. On this basis, it is conservatively estimated that not fewer than 250,000 lives are at present (1916) annually saved from the ravages of diphtheria and croup in the various countries of the world where antitoxin is more or less extensively used as a curative agent.

In the United States the positive evidence of the value of antitoxin is so abundant that it is difficult to select the best illustrative examples. Table 2, however, which shows the comparative mortality in twelve representative American cities for pre-antitoxin and antitoxin periods should suffice to convince any skeptics who may yet survive.* In these twelve cities combined the average annual mortality rate of diphtheria and croup has declined from 121.9 per 100,000 of population during 1885 to 1894 to 28.0 during 1905 to 1914—an actual decrease in the death-rate of 93.9, or 76.9 per cent. This means that in these twelve cities only the present annual saving of lives from a terrible form of death is approximately 10,000.

The decline in the mortality from

TABLE 2. COMPARISON OF THE MORTALITY FROM DIPHTHERIA AND CROUP IN TWELVE AMERICAN CITIES. PRE-ANTITOXIN AND ANTITOXIN PERIODS.

Cities.	Pre-Antitoxin Period	Antitoxin Period	Reduction in Mortality.	
	1885–1894.	1905–1914.	Antitoxin Period as against Pre-Antitoxin Period	
	Rate per 100,000 population.	Rate per 100,000 population.	Decrease in the rate.	Average annual reduction in the number of deaths.
Boston	118.1	24.3	93.8	622
Chicago	130.6	33.0	97.6	2,109
Cincinnati	107.4	15.9	91.5	331
Detroit	163.4	31.6	131.8	597
New York (Man. and Bronx)	152.4	33.5	118.9	3,240
Memphis	41.5	15.4	26.1	53
Milwaukee	105.8	26.7	79.1	290
New Orleans	73.2	16.2	57.0	191
Philadelphia	107.4	29.7	77.7	1,193
St. Louis	117.7	21.5	96.2	655
San Francisco	89.5	12.2	77.3	319
Washington	66.0	9.7	56.3	185
Total (12 cities)	121.9	28.0	93.9	9,785

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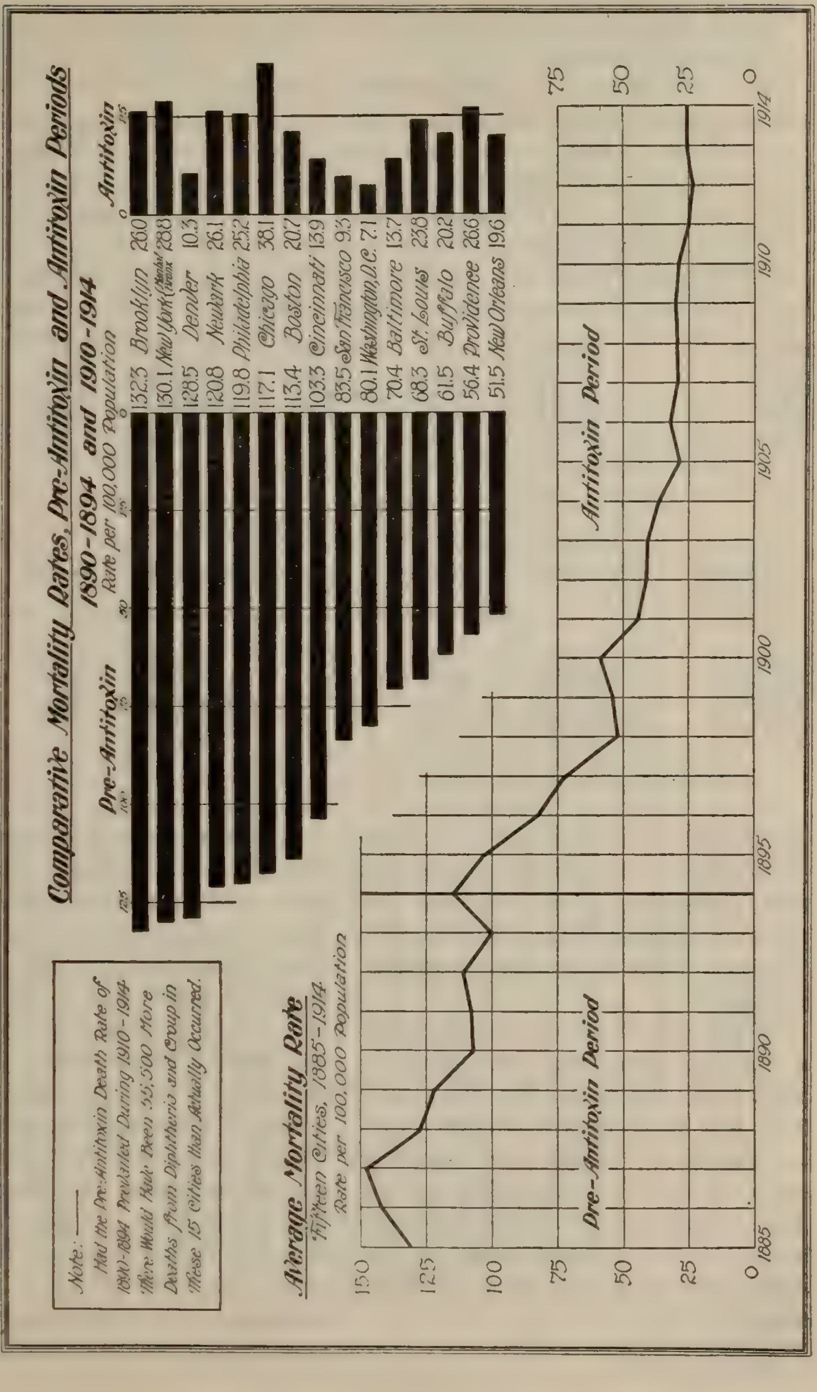
* See also Chart II, p. 449.

CHART II.



Note:—
Had the Pre-Antitoxin Death Rate of 1890-1894 Prevailed During 1910-1914 There Would Have Been 55,500 More Deaths from Diphtheria and Croup in These 15 Cities than Actually Occurred.

TABLE 3. MORTALITY FROM DIPHTHERIA AND CROUP IN OLD NEW YORK CITY (MANHATTAN AND BRONX BOROUGHS) WITH DISTINCTION OF SEX AND AGE, 1880-1915.

(Rates per 100,000 of Population.)

Under 5 Years of Age.

Years.	Males.			Females.		
	Population.	Deaths.	Rate.	Population.	Deaths.	Rate.
1880-84.........	361,613	4,631	1,280.7	357,550	4,355	1,218.0
1885-94.........	852,785	10,147	1,189.9	846,640	9,227	1,089.8
1895-04.........	1,165,780	5,627	482.7	1,158,380	5,174	446.7
1905-14.........	1,412,620	4,320	305.8	1,389,266	3,604	259.4
1915............	154,754	305	197.1	151,594	280	184.7

5-14 Years of Age.

Years.	Population.	Deaths.	Rate.	Population.	Deaths.	Rate.
1880-84.........	607,911	1,024	168.4	612,545	1,135	185.3
1885-94.........	1,359,301	2,063	151.8	1,375,052	2,265	164.7
1895-04.........	1,818,820	1,103	60.6	1,836,225	1,290	70.3
1905-14.........	2,297,820	746	32.5	2,324,166	811	34.9
1915............	254,211	67	26.4	257,653	75	29.1

diphtheria and croup in old New York (Manhattan and Bronx boroughs), with distinction of sex and for the two most important age periods, under 5 years and 5 to 14 years, is illustrated in Table 3.

In Newark, N. J., a very accurate record has been kept of diphtheria cases beginning with 1895 when antitoxin first began to be extensively used in that city.* From the beginning antitoxin has been furnished by the city without charge. In Table 4 there is presented a complete record of this somewhat unique experience of a large American city.

This table shows that there has been a much more favorable mortality in cases where antitoxin has been used than in cases where it was not used. Even in the first five-year period the antitoxin cases had a mortality 50 per cent. less than the others. It is interesting also to note that the fatality per cent. of the antitoxin cases has gradually been reduced from 13.5 in 1895 to only 4.4 in 1915, but no such marked reduction has taken place in the lethal rates of the other cases. These statistics have not been "doctored" by the omission from the antitoxin cases of the so-called "moribund" cases, or cases which terminate fatally within twenty-four hours. All cases treated with antitoxin are included under the heading "Antitoxin Used."

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* See Chart I, p. 447.

Hospital Statistics are even more convincing than general data as to the value of antitoxin as a life saver. The experience of the Boston City Hospital, Table 5, is a typical illustration of reduced fatality among diphtheria cases referred to hospitals for treatment. Many of these were severe cases, and often so far-advanced that tracheotomy or intubation was necessary. All statistics show that operative cases have a higher case fatality than non-operative cases. It is interesting to note that in the ten years previous to antitoxin the fatality per cent. was over 42.0, during 1895 to 1899 it dropped to 12.7, and it is now only 7.6.

TABLE 4. REDUCTION OF DIPHTHERIA MORTALITY IN NEWARK, N. J., AS THE RESULT OF ANTITOXIN, 1895–1915.

	Antitoxin used.			Antitoxin not used.		
Year.	Cases.	Deaths.	Fatality percentage.	Cases.	Deaths.	Fatality percentage.
1895........	384	52	13.5	937	221	23.6
1896........	905	106	11.7	356	112	31.5
1897........	563	61	10.8	406	76	18.7
1898........	646	68	10.5	373	65	17.4
1899........	798	70	8.8	372	54	14.5
1895–99.....	3,296	357	10.8	2,444	528	21.6
1900........	987	80	8.1	430	63	14.7
1901........	956	58	6.1	198	45	22.7
1902........	775	61	7.9	210	44	21.0
1903........	953	71	7.5	197	49	24.9
1904........	1,399	95	6.8	254	55	21.7
1900–04.....	4,970	365	7.3	1,289	256	19.9
1905........	1,421	82	5.8	193	28	14.5
1906........	1,171	72	6.1	102	27	26.5
1907........	913	64	7.0	126	31	24.6
1908........	726	49	6.7	80	17	21.3
1909........	1,117	64	5.7	121	41	33.9
1905–09.....	5,348	331	6.2	622	144	23.2
1910........	1,252	80	6.4	133	24	18.0
1911........	1,247	56	4.5	92	18	19.6
1912........	1,005	76	7.6	93	15	16.1
1913........	1,489	89	6.0	105	21	20.0
1914........	1,416	78	5.5	82	11	13.4
1910–14.....	6,409	379	5.9	505	89	17.6
1915........	1,085	48	4.4	22	4	18.1

TABLE 5. MORTALITY FROM DIPHTHERIA AND CROUP IN THE BOSTON CITY HOSPITAL, 1885-1914.

Years.	Patients under treatment.	Deaths.	Fatality percentage.
1885-89 . . .	1,423	609	42.80
1890-94 . . .	2,156	910	42.21
1895-99 . . .	7,489	947	12.65
1900-04 . . .	8,257	849	10.28
1905-09 . . .	6,935	520	7.50
1910-14 . . .	6,286	476	7.57

In old New York (Manhattan and Bronx boroughs) the case fatality of diphtheria and croup has decreased from 69.4 per cent. during 1880 to 1884 to 8.2 per cent. during 1915. The details are presented in the following table:

TABLE 6. CASE FATALITY OF DIPHTHERIA AND CROUP IN NEW YORK CITY (MANHATTAN AND BRONX BOROUGHS), 1880-1915.

Years.	Number of cases.	Number of deaths.	Fatality percentage.
1880-84 . . .	16,329	11,332	69.4
1885-94 . . .	57,120	24,062	42.1
1895-04 . . .	98,753	13,486	13.7
1905-14 . . .	90,284	9,232	10.2
1915.	9,109	750	8.2

The experience of the Metropolitan Asylums Hospitals of London conforms to the data available in this country, as it relates to improvement in the case fatality of diphtheria and croup. In the following table this English experience is summarized by 5-year intervals for the 25-year period, 1890 to 1914. It is interesting to note that if the same average percentage of deaths had obtained during 1910-1914 as in 1890-1894, there would have been 5,568 more deaths during 1910-1914 than actually occurred.

TABLE 7. RESULTS OF DIPHTHERIA CASES WITH REFERENCE TO ANTITOXIN TREATMENT—METROPOLITAN ASYLUMS HOSPITALS, LONDON, ENG., 1890-1914.

Years.	Number of cases.	Number of deaths.	Fatality percentage.
1890-94 . . .	10,777	3,196	29.7
1895-99 . . .	29,058	4,928	17.0
1900-04 . . .	31,774	3,549	11.2
1905-09 . . .	24,733	2,275	9.2
1910-14 . . .	25,179	1,910	7.6

There is positive and overwhelming evidence that the earlier the use of antitoxin in any given case the better the result and the greater the chance of recovery. Many statistics could be brought forward to support this conclusion, but Table 8, compiled from the annual reports of the Philadelphia Department of Health, must suffice for this country.

Two periods have purposely been taken, first to show that the same general results appear in both periods and, secondly to show that better results are being secured with continued improvements in the technique of antitoxin use. For the ten-year period, 1905 to 1914, it is shown that the case mortality when antitoxin was administered the first day of the onset of the disease was only 0.7 against 5.3 for the second day, 7.7 for the third,

TABLE 8. SUMMARY OF MORTALITY FROM DIPHTHERIA IN PHILADELPHIA, PA., BY DURATION OF THE DISEASE AT TIME OF ANTITOXIN TREATMENT.*

	1905–1909.			1910–1914.			1905–1914.
	Number of cases.	Number of deaths.	Fatality percentage.	Number of cases.	Number of deaths.	Fatality percentage.	Fatality percentage.
First day ...	415	...	....	443	5	1.1	0.7
Second day .	2,125	107	5.0	2,285	128	5.6	5.3
Third day ..	1,661	146	8.8	2,197	150	6.8	7.7
Fourth day..	999	124	12.4	1,409	108	7.7	9.6
Fifth day...	543	79	14.5	673	62	9.2	11.6
Sixth day...	381	52	13.6	462	43	9.3	11.3
After sixth day......	637	91	14.3	595	68	11.4	12.9
Total	6,761	599	8.9	8,064	564	7.0	7.8

* These statistics are exclusive of diphtheria cases complicated with other infectious diseases. They are also exclusive of cases dying within 24 hours of treatment.

9.6 for the fourth, over 11 per cent. for the fifth and sixth days and 12.9 per cent. for such cases as were not treated with antitoxin until after at least six days duration of the disease. These statistics are strikingly significant of the importance of the early use of antitoxin and they also substantiate the now almost universally accepted claim that antitoxin is one of the main factors which have contributed to the decline in diphtheria mortality since 1894.†

The following quotation bears directly upon this point and is well worth a very careful reading by every physician and health official: "The death-rate among actual cases has been immensely lowered by the use of antitoxin. It is the duty of the State to place an adequate supply at the disposal of every practicing physician, to do everything possible to encourage its use and to provide for its administration to those who are unable to pay for the services of a private physician. This is all that can reasonably be expected from health officials. The further lowering of the death-rate rests absolutely in the hands of practicing physicians."‡

Discussing a paper on Diphtheria in Elementary Schools and Its Prevention, by J. Wright Mason, Medical Officer of Health, Kingston-upon-Hull, Dr. J. M. Clements of Hull, Eng., made the following statement: "The mortality among cases coming under my care from 1903 to 1906, classified according to the day of the disease on which serum treatment commenced, showed that of those coming under treatment on the first day the mortality was *nil;* second, 1.5 per cent.;

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† See Chart I, p. 447.

‡ A Plea for the Early Use of Antitoxin in Diphtheria. Matthias Nicoll, Jr., M. D., *Health News*, November, 1915, N. Y. State Department of Health.

third, 8.0 per cent.; fourth, 15.7 per cent.; fifth, 19.8 per cent.; sixth, 24.0 per cent. These figures tallied very closely with the much larger figures collected by Doctor McCombie, of the Brook Hospital. They showed the great importance of giving serum early in the disease, and the large number of lives that would be saved if all cases came under antitoxin on the first or second day of illness." *

The State Department of Health of Pennsylvania for a number of years has made a systematic effort to extend the use of antitoxin, has furnished the serum free for dispensary use, and has kept a statistical record of the results achieved. The following tables should, therefore, be of general interest:

TABLE 9. RESULTS OF ANTITOXIN CURATIVE TREATMENT OF DIPHTHERIA, STATE OF PENNSYLVANIA, NOVEMBER 4, 1905 TO DECEMBER 31, 1912.†

Years.	Number treated.	Deaths.	Fatality percentage.
1905......	293	38	12.97
1906......	3,529	393	11.14
1907......	5,271	376	7.13
1908......	6,336	542	8.55
1909......	5,365	416	7.75
1910......	6,524	559	8.57
1911......	7,793	510	6.54
1912......	9,919	763	7.69
Total ...	45,030	3,597	7.99

† The total number of recoveries during the period, 1905–1912, was 41,433, or 92.01 per cent. of the cases treated.

Since 1906 the case fatality rates of antitoxin-treated cases have remained about the same from year to year and the rates indicate that there is too much delay in the use of the serum.

In the next table the results in Pennsylvania of antitoxin treatment for immunization purposes are presented for an eight-year period:

TABLE 10. RESULTS OF ANTITOXIN TREATMENT FOR IMMUNIZATION PURPOSES, STATE OF PENNSYLVANIA, NOVEMBER 4, 1905 TO DECEMBER 31, 1912.‡

Years.	Number treated.	Number developing diphtheria.	Deaths.	Fatality percentage in diphtheria cases.
1905....	155	5	..	....
1906....	2,334	77	3	3.90
1907....	3,799	34	2	5.88
1908....	3,965	45	8	17.78
1909....	4,847	109	3	2.75
1910....	5,194	87	6	6.90
1911....	6,906	125	4	3.20
1912....	8,581	94	3	3.19
Total	35,781	576	29	5.03

‡ Source: Report of Commissioner of Health, State of Pennsylvania, 1912, Part 2, p. 865.

The use of antitoxin to temporarily immunize susceptible individuals in diphtheria epidemics or in scarlet fever patients segregated in hospitals is likely to play a very important rôle in the future. As Dr. William H. Park and others have pointed out this is now made feasible by the perfection of the technique of the Schick test. There is already sufficient evidence to indicate that along this line of effort lies the hope that antitoxin may prove quite as important in preventing diphtheria as in curing it. To date there is no conclusive evidence that diph-

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* Transactions of the Sanitary Institute, June, 1908, pp. 227–8.

theria morbidity has decreased, but there can be no reasonable doubt that its mortality has declined and mainly as the direct result of antitoxin treatment.

Notwithstanding the great reduction in the diphtheria death-rate as a direct result of antitoxin, better diagnosis, more general hospital care, etc., diphtheria is still responsible for at least three per cent. of the total mortality at ages under 15 years in the countries of the temperate zones for which reliable vital statistics are available. In the registration area of the United States this percentage is 4.4; in England and Wales it is 2.9; in Norway, 6.0; in Austria, 4.5; and in Bavaria, 3.1.

Diphtheria still causes more deaths in the United States than whooping-cough, measles or scarlet fever. This disease, therefore, still remains a distinct menace to children notwithstanding antitoxin, its specific curative agent. The average annual number of deaths from diphtheria and croup in the United States is approximately 17,000, against 10,000 from whooping-cough, 9,000 from measles and 8,000 from scarlet fever. In Table 11 the relative importance of these four diseases is clearly set forth and with distinction of age.

It is interesting to note that diphtheria and croup causes a larger percentage (3.3) of the total mortality at ages under five years than any of the

TABLE 11. COMPARATIVE MORTALITY FROM DIPHTHERIA AND CROUP, WHOOPING-COUGH, MEASLES, AND SCARLET FEVER. REGISTRATION AREA, U. S., 1910–1914.

Age.	Diphtheria and Croup.			Whooping-cough.		
	Deaths.	Percentage distribution by age.	Percentage of total deaths, all causes.	Deaths.	Percentage distribution by age.	Percentage of total deaths, all causes.
Under 5 years ...	35,691	62.2	3.3	30,074	95.2	2.8
5–9 years	14,871	25.9	16.0	1,167	3.7	1.3
10–19 years	4,497	7.8	2.8	175	0.5	0.11
20 and over	2,355	4.1	0.08	179	0.56	0.01
All ages.......	57,414	100.0	1.34	31,595	100.0	0.74
	Measles.			Scarlet Fever.		
Under 5 years ...	23,649	80.6	2.2	13,685	53.9	1.3
5–9 years	2,446	8.3	2.6	7,176	28.3	7.7
10–19 years	1,233	4.2	0.8	2,881	11.4	1.8
20 and over	2,001	6.8	0.07	1,632	6.4	0.05
All ages.......	29,329	100.0	0.68	25,374	100.0	0.59

other three diseases, whooping-cough being second with 2.8 per cent., measles third with 2.2 per cent. and scarlet fever fourth with 1.3 per cent. At ages 5 to 9 years diphtheria and croup causes no less than 16.0 per cent. of the total mortality from all causes at those ages, scarlet fever is second with 7.7 per cent.; measles is third with 2.6 per cent. and whooping-cough is fourth with only 1.3 per cent. At ages 15 to 19 years diphtheria and croup causes 2.8 per cent. of the total mortality, scarlet fever 1.8 per cent., measles 0.8 per cent. and whooping-cough only 0.11 per cent. At the adult ages, 20 years and over, no one of these four diseases causes as much as one-tenth of one per cent. of the total mortality.*

This comparison is interesting also from the viewpoint of age distribution of the deaths. Diphtheria and croup, in this respect, resembles scarlet fever more closely than measles or whooping-cough. A greater proportion of the whooping-cough deaths occur at ages under five years (95.2 per cent.) than is true of any of the other three causes. Measles is second with 80.6 per cent., diphtheria is third with 62.2 per cent. and scarlet fever is fourth with 53.9 per cent. At the other age extreme, 20 years and over, measles stands first with 6.8 per cent. of its deaths occurring at those ages, scarlet fever is a close second with 6.4 per cent., diphtheria is third with 4.1 per cent. and whooping-cough is a poor fourth with only 0.56 per cent. of its total mortality falling within the age period 20 years and over.

GEOGRAPHICAL DISTRIBUTION.

Diphtheria, so far as can be determined from official reports, is world-wide in its distribution. The average annual death-rates from this disease differ widely in the various countries in any given period of time. Just what the underlying factors are which contribute to this result and what their relative importance is still a more or less baffling mystery. Temperature is probably the climatic factor of most importance in determining the extent of the spread of diphtheria and its seasonal prevalence. Clemow concludes "That temperature is a powerful factor in determining the distribution of this disease, and that extremes of heat or cold are unfavorable to its prevalence." He concludes that "Heat is probably more unfavorable than cold, for while diphtheria is found as a severe epidemic in no tropical country, it is endemic and a cause of high mortality in such cold countries as Norway and Sweden. Clemow was well aware also that "Diphtheria in many temperate countries is found to be most active in the autumn and winter, and least so in the warm summer months." †

Many writers, including Longstaff, Newsholme, Creighton, and Marsden, have sought to establish a correlation between diphtheria epidemics and a succession of dry years; in other words, an inverse or negative correlation between diphtheria mortality and a high level of ground water. In England and Wales this negative correlation is high, or more than −0.6. In

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* See Chart V, p. 470.

† Clemow, The Geography of Disease, p. 145.

Norway, however, the factor of inverse correlation is insignificant and the same is true of Newark, N. J., although long periods of years have been taken in both these latter cases. Rainfall may be a conditioning factor in diphtheria prevalence, but it evidently is only one of many, for there are numerous and important exceptions to its dominating influence.* Altitude and soil have been considered by some authorities to have an important effect on the diffusion of diphtheria but nothing like definite proof is yet possible from the available statistics of this disease.

The seasonal prevalence of diphtheria in most temperate climates is probably associated with bad ventilation and closer contact of larger numbers of susceptible persons in schools, houses, etc., in the winter than in the summer season. Whatever the cause, it is almost universally true that diphtheria cases in Northern latitudes reach a minimum in August or September, then gradually increase throughout the late fall and winter, attaining a maximum or high crest in April or May. Some writers attribute a large part of this school-season diphtheria to compulsory school attendance but Newsholme, Chapin and others have repeatedly pointed out that the great majority of the cases of diphtheria are of children under school age. The seasonal prevalence of diphtheria and croup in Greater New York is illustrated in the accompanying Chart III, page 458. The weekly rates of cases and deaths in New York City are typical of those for any large American city.

Just as the seasonal distribution of diphtheria may possibly be correlated with closer and more confined grouping of the population in schools, houses, shops, etc., so the more general close-crowding of population in cities as compared with rural areas seems to afford a ready explanation for some of the comparative differences in the death-rates from diphtheria.

In the United States the diphtheria mortality is at present considerably higher in the urban than in the rural areas,† as is clearly shown in Table 12.

In every one of the fifteen years, 1900 to 1914, the urban death-rate has been materially higher than the rural rate. It is significant also to note that comparing the death-rates for the first and last five-year periods the average annual death-rate in the urban area has declined from 42.8 per 100,000 population during 1900 to 1904 to 21.7 during 1910 to 1914, or nearly 50.0 per cent., while the decline in the rural rate has been from 20.1 to 15.0, or only 25.0 per cent. The urban death-rate is being so well controlled by antitoxin treatment that it is probable that it will soon be no more than equal to or even lower than the rural death-rate.

The geographical distribution of diphtheria mortality in the United States during the fifteen-year period, 1900 to 1914, is succinctly set forth in Tables 13 and 14, pp. 460 and 461.

These tables show a progressive increase in the rate from the west east-

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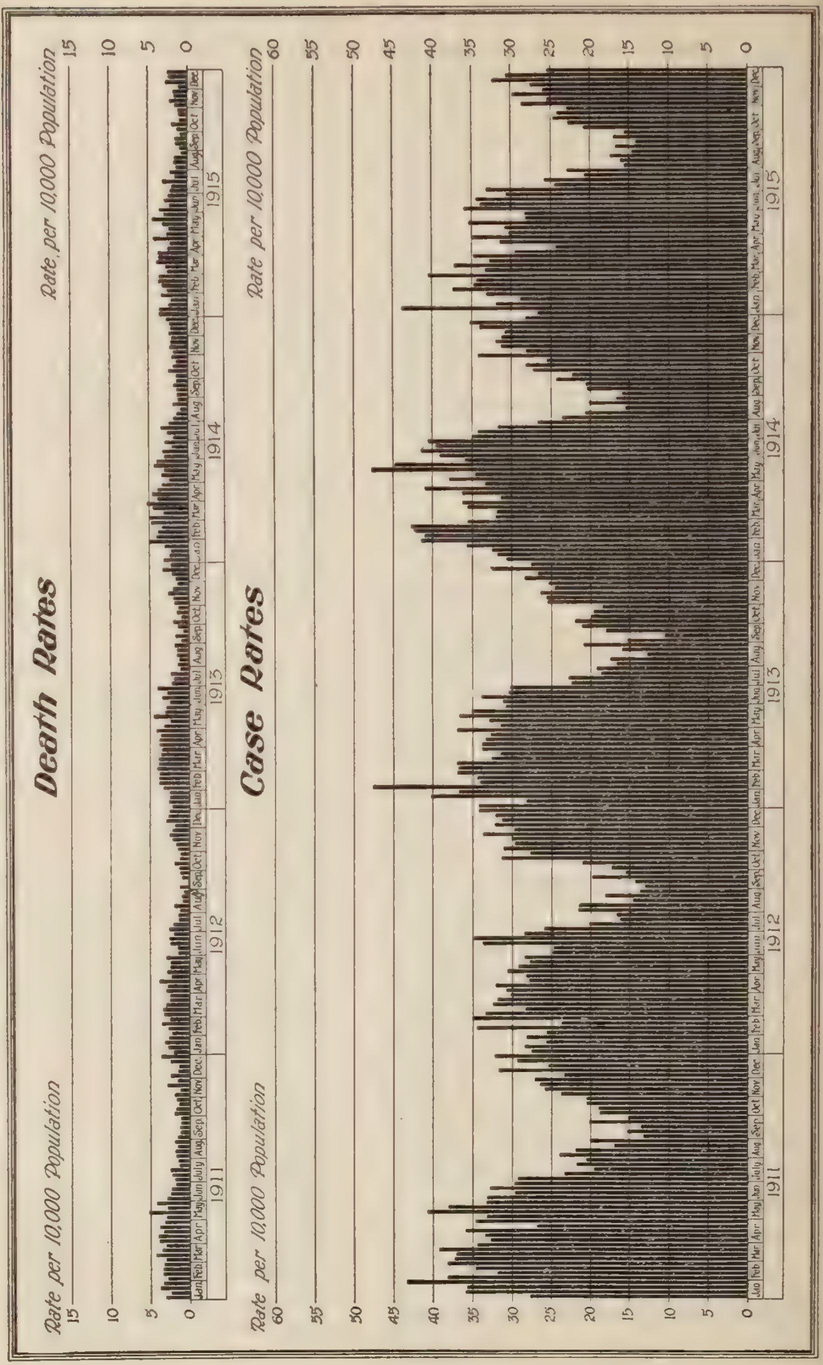
*In testing out these correlations, I have had the assistance of Mr. Arne Fisher, one of my co-workers, and author of the well-known work on the Mathematical Theory of Probabilities.

†See Chart I, p. 447.

CHART III.



Seasonal Prevalence of Diphtheria and Croup

New York City, 1911 to 1915

TABLE 12. MORTALITY FROM DIPHTHERIA AND CROUP IN THE REGISTRATION AREA OF THE UNITED STATES WITH DISTINCTION OF URBAN AND RURAL AREAS, 1910–1914.

	Urban.*			Rural.		
	Population.	Deaths.	Rate per 100,000.	Population.	Deaths.	Rate per 100,000.
1900	10,675,611	5,591	52.4	9,289,538	2,465	26.5
1901	11,188,101	4,816	43.0	9,118,942	1,966	21.6
1902	11,477,929	4,568	39.8	9,171,012	1,560	17.0
1903	11,754,911	4,878	41.5	9,235,930	1,638	17.7
1904	12,029,302	4,623	38.4	9,307,413	1,634	17.6
1900–04	57,125,854	24,476	42.8	46,122,835	9,263	20.1
1905	12,372,228	3,712	30.0	9,364,680	1,408	15.0
1906	18,195,041	5,815	32.0	15,640,988	3,076	19.7
1907	18,737,525	5,493	29.3	15,871,371	2,873	18.0
1908	20,417,270	5,455	26.7	18,288,591	3,021	16.5
1909	23,066,405	5,632	24.4	21,215,280	3,182	15.0
1905–09	92,788,469	26,107	28.1	80,380,910	13,560	16.9
1910	25,187,805	6,482	25.7	22,619,961	3,608	16.0
1911	27,485,457	5,883	21.4	26,899,777	4,075	15.1
1912	28,129,824	5,502	19.6	27,122,299	4,207	15.5
1913	29,244,160	6,324	21.6	29,068,435	4,280	14.7
1914	30,287,640	6,320	20.9	30,826,560	4,243	13.8
1910–14	140,334,886	30,511	21.7	136,537,032	20,413	15.0

* By urban is meant all municipalities of 10,000 or more population.

ward and from the south northward, density of population, with all that it implies, apparently playing an important rôle in the geographical distribution of diphtheria mortality. In the southern states, however, the mild climate and more general out-of-doors life and the large negro population are factors which doubtless operate to keep the diphtheria death-rate lower than in the north, entirely aside from the question of relative population density. On the Pacific coast also the generally mild climate with rainy season intervals may account in part, at least, for the comparatively low diphtheria death-rate.

EPIDEMICITY.

Newsholme has probably written the best and most comprehensive work on the epidemicity of diphtheria.† He brings forward abundant evidence to support the theory that this disease is epidemic in character and has now become endemic and pandemic in most, if not all, the temperate countries of the world. The statistics of the United States which were drawn upon

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† Epidemic Diphtheria, by Arthur Newsholme, M. D., London, 1898.

TABLE 13. MORTALITY FROM DIPHTHERIA AND CROUP IN THE UNITED STATES, REGISTRATION STATES, POPULATION AND DEATHS, AGES UNDER 20, 1910–1914.

	Population.	Deaths.	Rate per 100,000 population.
9 Eastern States:			
Maine	1,363,083	425	31.2
New Hampshire	760,720	320	42.1
Vermont	652,853	137	21.0
Massachusetts	6,258,765	2,945	47.1
Rhode Island	1,057,367	647	61.2
Connecticut	2,141,857	1,138	53.1
New York	17,399,602	9,602	55.2
New Jersey	5,159,810	2,915	56.5
Pennsylvania	16,059,381	10,061	62.6
Total	50,853,438	28,190	55.4
4 Southern States:			
Maryland	2,691,459	887	33.0
Virginia (1913 and 1914)	2,032,531	625	30.7
North Carolina	886,114	287	32.4
Kentucky (1911 and 1914)	4,332,033	2,355	54.4
Total	9,942,137	4,154	41.8
7 Central States:			
Ohio	9,218,466	4,028	43.7
Indiana	5,360,838	2,111	39.4
Michigan	5,668,623	2,443	43.1
Minnesota	4,524,888	1,437	31.8
Wisconsin	5,094,066	1,453	28.5
Missouri (1911–1914)	5,500,431	2,489	45.3
Kansas (1914)	747,872	159	21.3
Total	36,115,184	14,120	39.1
3 Rocky Mountain States:			
Colorado	1,602,620	393	24.5
Montana	712,062	145	20.4
Utah	930,115	245	26.3
Total	3,244,797	783	24.1
2 Pacific Coast States:			
California	3,994,562	920	23.0
Washington	2,249,047	375	16.7
Total	6,243,609	1,295	20.7
Grand total (25 Registration States)	106,399,165	48,542	45.6

TABLE 14. GEOGRAPHICAL DISTRIBUTION OF THE MORTALITY FROM DIPHTHERIA AND CROUP IN ONE HUNDRED CITIES OF THE UNITED STATES, 1900–1914.

Geographical areas.	Number of cities.	Aggregate population.	Number of deaths from diphtheria and croup.	Death-rate per 100,000 total population.
Middle Atlantic	29	136,554,575	49,442	36.2
New England	20	35,305,335	10,496	29.7
East Central	16	66,638,804	19,077	28.6
West Central	9	30,294,114	7,921	26.1
Rocky Mountain	3	4,689,215	1,170	25.0
Southern	16	35,383,983	6,064	17.1
Pacific Coast	7	15,989,672	2,575	16.1

extensively by Newsholme in 1898 are even more conclusively confirmatory today of his main thesis that diphtheria, although endemic and pandemic is still epidemic both in a local and in a universal sense. There is evidence that diphtheria epidemics spread in great waves and that possibly they are favored by certain climatic and meteorological conditions, even though personal infection is the most important single factor in the spread of diphtheria infection. Anything like an exhaustive statistical reëxamination of the epidemic character of diphtheria is beyond the scope of this paper, and is quite unnecessary in view of Newsholme's work. In this connection, however, it is interesting to note that in each of 100 cities of the United States during a period of fifteen years,

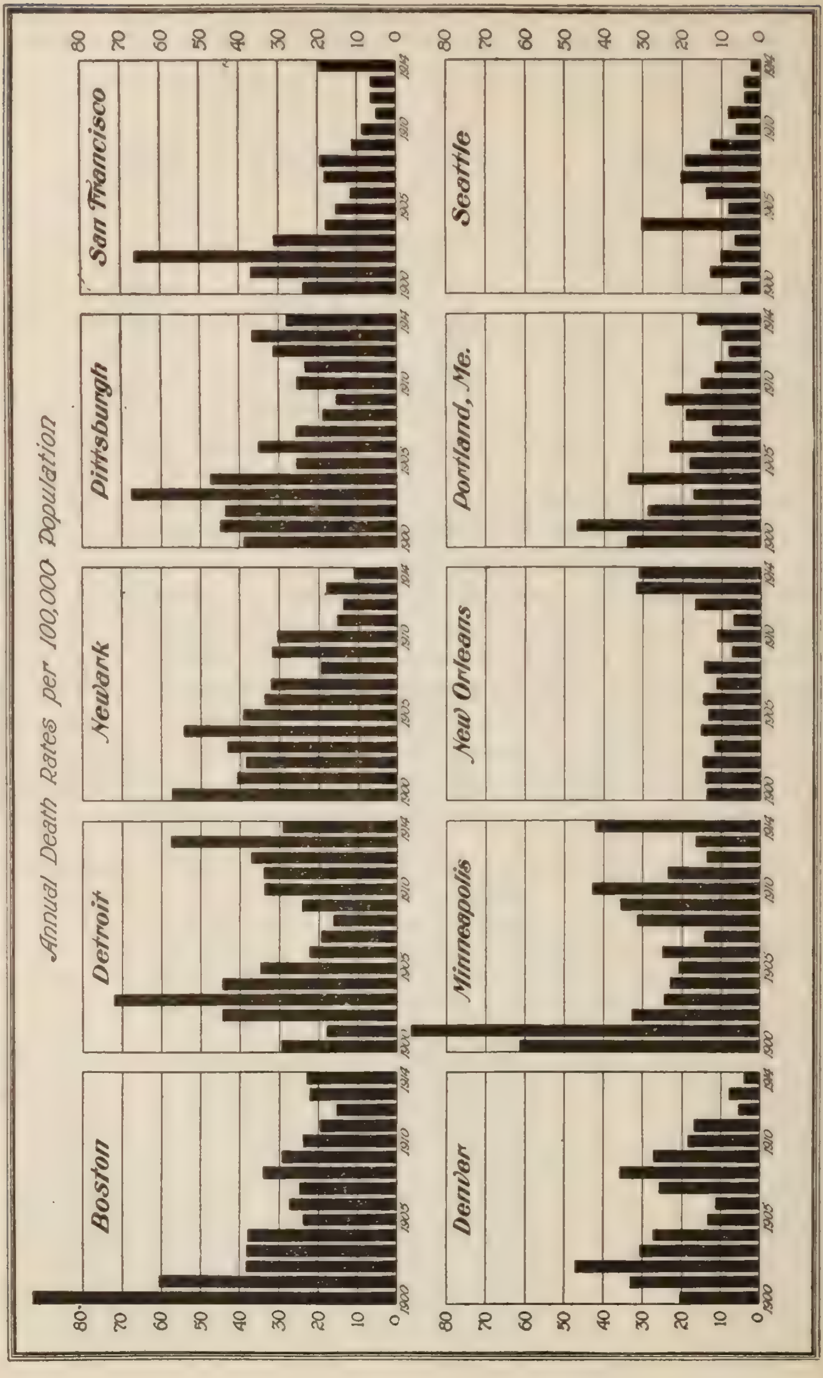
TABLE 15. MORTALITY FROM DIPHTHERIA, TWENTY REPRESENTATIVE AMERICAN CITIES, 1900–1914.

(Death-rates per 100,000 Population, All Ages.)

Cities.	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914
Baltimore	57.4	33.2	24.3	29.1	21.2	17.6	20.8	14.7	12.0	13.7	11.4	12.0	15.8	15.0	14.8
Boston	92.4	60.2	38.3	38.2	37.9	23.9	27.4	24.8	33.9	29.5	23.9	19.7	15.3	22.1	22.9
Charleston, S. C.	19.7	17.8	14.2	3.5	8.8	5.2	5.2	12.1	1.7	8.5	13.6	8.4	6.7	5.0	6.7
Chicago	49.6	28.6	34.7	34.2	21.4	22.3	27.5	27.1	26.5	31.7	37.4	38.2	41.2	41.2	32.2
Cincinnati	27.9	21.6	23.2	18.4	13.3	22.6	22.5	14.9	15.9	11.4	9.9	12.2	15.7	13.1	18.2
Denver	20.2	33.1	47.0	30.4	27.3	13.4	11.3	25.9	35.4	27.0	18.6	16.7	5.6	8.0	4.1
Detroit	29.1	18.0	44.4	71.7	44.4	34.7	22.6	19.6	16.1	24.3	33.8	33.9	37.1	57.6	29.2
Fall River	23.8	23.8	47.5	40.8	27.5	26.5	25.7	20.6	19.2	17.1	19.2	22.0	26.1	27.4	20.7
Minneapolis	61.2	89.0	32.7	24.8	23.2	21.0	25.1	14.3	31.4	35.6	42.9	23.8	13.9	16.8	42.2
Newark	57.3	40.8	38.8	43.1	54.2	39.2	33.9	32.2	19.5	31.7	30.6	15.7	14.1	18.2	11.1
New Orleans	13.9	14.3	14.8	11.9	15.2	13.4	14.7	11.1	14.6	7.5	10.9	7.2	16.5	31.7	31.0
New York (Greater)	65.7	56.2	54.7	55.1	52.7	37.3	44.4	39.3	38.1	36.7	35.6	25.6	22.3	26.1	28.3
Philadelphia	85.1	49.2	38.4	44.9	39.1	32.7	39.0	33.5	32.5	33.4	30.8	31.1	23.7	21.5	19.4
Pittsburg	39.0	44.8	43.5	67.3	47.7	25.6	35.1	25.3	18.8	15.5	25.4	23.4	31.2	36.6	28.0
Portland, Me.	33.9	47.0	28.9	17.1	33.6	18.4	23.5	12.5	19.3	24.2	15.3	11.7	8.3	9.8	16.1
Providence	31.3	47.7	39.0	44.3	45.9	36.2	25.0	32.0	36.8	26.3	21.7	24.7	32.7	29.6	24.1
St. Louis	66.8	47.3	29.6	32.3	27.4	25.6	17.7	17.4	19.0	26.0	16.1	17.6	21.2	29.2	34.7
San Francisco	23.9	37.0	66.4	31.2	18.2	15.5	11.8	18.4	19.6	11.2	8.8	5.2	6.7	6.6	19.4
Seattle	5.0	12.8	10.4	6.8	30.1	8.5	14.2	20.2	19.5	13.0	6.3	8.7	4.3	4.4	2.2
Washington, D. C.	43.4	36.6	17.3	8.5	17.3	16.0	13.5	9.2	8.4	14.4	9.3	5.6	4.4	7.8	8.2

CHART IV.

Mortality from Diphtheria and Croup



1900 to 1914, there was one or more deaths from diphtheria every year, with only one exception. During this period of fifteen years the annual diphtheria death-rates of the 100 cities (1500 rates) varied from zero, in the one exceptional case, to 173 per 100,000 of population. Practically every one of the cities also presented evidence of the epidemic character of diphtheria in the varying annual death-rates during the fifteen-year period. These facts are illustrated for ten representative cities in Chart IV, page 462. The detail statistics upon which that chart is based are presented in Table 15, p. 461, which includes the data for twenty of the one hundred cities previously referred to and embraces the ten cities represented in Chart IV.

RACE.

Hirsch directed attention to the probability that there is no complete racial immunity to diphtheria.* He stated, however, that "in several of the epidemics in the United States, the negro children, who live under the most unfavorable conditions, have enjoyed a striking immunity from the disease."† Hoffman in his "Race Traits and Tendencies of the American Negro" called attention to the probably lesser liability of the colored race (negroes) to diphtheria and croup as compared with the white population.‡ Clemow remarks that "all the great divisions of the human family, including pure Mongols and full-blooded negroes, seem to be capable of becoming subjects of the disease, though probably both their susceptibility to attack and their power of recovery when attacked vary greatly. In China, for example, the disease is said to be much more intense and fatal in natives than in European residents, while in the United States the white races suffer much more than the black."§

In a very recent analysis of 3,778 deaths from scarlet fever in the Metropolitan Life Insurance Company's experience, Dublin has pointed out that the mortality was "markedly lower" for the colored than for the whites,|| and as scarlet fever follows closely in many respects the sex, age, and race characteristics of diphtheria it is safe to assume that the Metropolitan's experience with diphtheria will confirm that available in the general mortality of American cities and states.¶

In thirty southern cities combined, during the five years, 1909–1913, the average annual death-rate of the white population from diphtheria and croup was 13.7 per 100,000 of population, against an average rate of only 8.1 for the negro population. In Washington, D. C., the comparative data have been recorded for a number of years and include reported cases of diphtheria and croup as well as deaths. As Table 16 shows, the attack rates, as well as the death-rates, have been considerably higher for the white than

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* Handbook of Geographical and Historical Pathology, by Dr. August Hirsch, Vol. III, p. 106, London, 1886.

† *Ibid.*, p. 110.

‡ Race Traits and Tendencies of the American Negro, by Frederick L. Hoffman, pp. 113–115. The MacMillan Co., N. Y., 1896.

§ The Geography of Disease, by Frank G. Clemow, M. D., D. P. H., p. 146. Cambridge, Eng., 1903.

|| A Study of 1,153 Cases of Scarlet Fever, by Louis I. Dublin, Ph. D., 1916.

¶ See Chart I.

TABLE 16. ATTACK- AND DEATH-RATES FROM DIPHTHERIA AND CROUP IN WASHINGTON, D. C., BY AGE AND RACE, 1908–1915.

(Rates per 10,000 Population.)

Age.	Population.	Cases.	Attack-rate.	Deaths.	Death-rate.
White.					
Under 1 year	33,122	66	19.9	8	2.42
1–4 years	126,643	700	55.3	86	6.79
5–9 years	150,024	1,118	74.5	51	3.40
10–19 years	303,947	788	25.9	10	0.33
20 and over	1,328,794	551	4.1	9	0.07
All ages	1,942,530	3,223	16.6	164	0.84
Colored.					
Under 1 year	11,591	13	11.2	4	3.45
1–4 years	47,906	87	18.2	21	4.38
5–9 years	58,724	144	24.5	11	1.87
10–19 years	129,815	347	26.7	5	0.39
20 and over	520,804	144	2.8	5	0.10
All ages	768,840	735	9.6	46	0.60

for the colored population, except at ages 10 to 19 years when the rates have been about the same for white and colored. The attack rate for all ages combined, during the eight-year period, 1908 to 1915, was 16.6 per 10,000 white population as against only 9.6 for the colored. The comparative death-rates were 0.84 per 10,000 white population as against 0.60 for the colored.

The comparative mortality from diphtheria and croup of the white and colored races of Cuba are presented in Table 17 for the period 1910 to 1913, and according to age. These Cuban data show a white death-rate, ages 1 to 9 years, more than double the negro rate. The deaths for the other age periods are too few to give trustworthy rates.

The case-fatality is possibly markedly higher among negroes than among whites. At least that is the deduction to be made from the following statistics in Table 18, compiled from the excellent reports of the Health Department of Washington, D. C.

It is quite possible that some of these differences in the comparative case fatality may be the result of less complete reporting of negro cases of diphtheria. Probably, however, they are more readily to be explained as the result of less prompt and adequate treatment of the negro cases, with antitoxin and otherwise.

Only fragmentary data are available

TABLE 17. MORTALITY FROM DIPHTHERIA AND CROUP, BY AGE AND RACE, IN CUBA, 1910–1913.*

	White.			Colored.		
Ages.	Population.	Deaths.	Rate per 100,000 population.	Population.	Deaths.	Rate per 100,000 population.
Under 1 year....	211,666	47	22.2	78,162	19	24.3
1–9 years.......	1,582,867	501	31.7	673,895	99	14.7
10–19 years	1,290,978	20	1.5	579,488	7	1.2
20 years and over	3,315,086	7	0.2	1,450,925	6	0.4
All ages......	6,400,597	575	9.0	2,782,470	131	4.7

* Source: Sanidad y Benificencia, Boletin Oficial de la Secretaria, Habana.

TABLE 18. DIPHTHERIA AND CROUP, WHITE AND COLORED, WASHINGTON, D. C.

Years.	White.			Colored.		
	Cases.	Deaths.	Case fatality percentage.	Cases.	Deaths.	Case fatality percentage.
1896–1905...............	4,913	625	15.0	1,299	306	23.6
1906–1915...............	3,969	212	5.7	820	62	7.6
Total.................	8,882	837	9.4	2,119	368	17.4

to show the relative susceptibility of the American Indian to diphtheria and croup but so far as they go they indicate a lesser degree of susceptibility than for the Caucasian race. Chinese and Japanese, Hawaiians, Filipinos and Mexicans all are susceptible to diphtheria, and apparently equally so with Caucasians.

According to a special tabulation of the U. S. Bureau of the Census for the year 1910, out of a total of 886 deaths of Indians from all causes, only 3 were from diphtheria and croup; out of a total of 1,055 deaths of Chinese for the same year and same area (U. S. Registration area) there were 8 deaths from diphtheria and croup and out of 664 deaths of Japanese from all causes during the same year and for the same area, there were 3 deaths from diphtheria and croup. The child population, however, is a much more important element in the Indian than in either the Chinese or Japanese populations of the United States.

During this same year and for the same area there were reported 25 deaths of Indians from measles, 3 deaths from scarlet fever and 25 deaths from whooping-cough; among the Chinese there were reported 2 deaths from measles, no death from scarlet fever and 1 death from whooping-cough; among the Japanese there were reported 1 death from measles, no death from scarlet fever, and 10 deaths from whooping-cough. It is the opinion of Indian agency physicians that diphtheria is infrequently met with among Indians, and it is very infrequently noted on the agency morbidity reports.* During the six-year period, 1888 to 1893, only 325 cases of diphtheria were reported by Indian agency physicians of the United States as against 4,003 cases of whooping-cough and 7,805 cases of measles in the same Indian population.†

The mortality of Chinese from diphtheria in San Francisco, 1910–1914, according to a special investigation into the mortality of the Chinese in that city during the five-year period, 1910–1914, was as follows: 4 deaths from diphtheria, of which 3 occurred at ages under 15, and 1 in the age group 15–39. There were no deaths from diphtheria reported among the female Chinese population, but that population, is of course, quite limited in number.

According to a special investigation into the mortality of Mexicans in the cities of San Diego, Los Angeles, El Paso and San Antonio during the five-year period, 1910–1914, the mortality from diphtheria among Mexicans in these cities was as follows: *Males*, ages under 15 years, 38 deaths; 15–44 years, no deaths; 45 and over, no deaths; total, 38 deaths, or 0.6 per cent. of the deaths from all causes among male Mexicans. *Females*, ages under 15 years, 36 deaths; 15 to 44 years, 5 deaths; 45 and over, no deaths; total, 41 deaths, or 0.8 per cent. of the reported deaths of female Mexicans from all causes.

Because of their general interest and as bearing directly upon the question of relative racial susceptibility Tables 19 and 20 for the city of Manila and for the Hawaiian Islands are included.

SEX.

Thorne stated in 1894 that "Sex appears to have some slight influence in determining a liability to the disease (diphtheria) though it is not well marked. We find that more females die from the disease than males, but I have thought that this arises mainly from the fact that females are more exposed to infection than males. Little girls, when they are sick, are not nursed by little boys, but little boys are often nursed by little girls, and this care for the sick by females holds good in adult life. Men do not usually nurse women suffering from diphtheria, whereas males thus affected are usually nursed by women. A fallacy therefore underlies the figures bearing on the incidence of the disease as it affects the sexes, in so far as the mere influence of sex is concerned."‡

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* Contagious and Infectious Diseases Among the Indians. Senate Document, No. 1038, pp. 57 and 58. Washington, D. C., 1913.

† Statistics compiled from the annual reports of the U. S. Commissioner of Indian Affairs.

‡ The Etiology, Spread and Prevention of Diphtheria, by R. Thorne Thorne, Sanitary Institute, April, 1894.

TABLE 19. MORTALITY FROM DIPHTHERIA AND CROUP IN THE CITY OF MANILA, P. I., BY RACES, 1905–1914.

Race.	Total population.	Population under 20.	Deaths.	Rate per 100,000	
				Total population.	Population. under 20.
American	47,585	5,948	3	6.3	50.4
Chinese	176,065	10,388	..	..	..
Filipino	2,108,016	834,775	77	3.7	9.2
All others	47,586	25,506	1	2.1	3.9
Total	2,379,253	876,617	81	3.4	9.2

TABLE 20. MORTALITY FROM DIPHTHERIA AND CROUP IN HAWAII, BY RACES, JULY 1, 1911 TO JUNE 30, 1915.

Race.	Total population.	Population under 20.	Deaths.	Rate per 100,000	
				Total population.	Population under 20.
Hawaiian	99,423	39,670	10	10.1	25.2
Part-Hawaiian	55,804	36,831	6	10.8	16.3
Chinese	83,723	24,196	9	10.7	37.2
Japanese	344,435	97,475	43	12.5	44.1
Portuguese	94,093	53,445	14	14.9	26.2
Other Caucasian	123,820	44,947	15	12.1	33.4
All others	68,833	20,306	3	4.4	14.8
Total	870,131	316,870	100	11.5	31.6

Longstaff states that he found the total female mortality from diphtheria to be seven per cent. in excess of the male mortality in England after population differences were allowed for. His statistics also showed that this excessive female mortality occurred mainly between the fifth and fifteenth years of age.*

Creighton states that "Diphtheria is the only epidemic disease besides whooping-cough which is more fatal to females than to males in proportion to the numbers of each sex living."†

For England and Wales during the five-year period, 1909 to 1913, the comparative death-rates of males and females are shown in detail, and with distinction of age, in Table 21. The percentage distribution, by age, of the deaths from diphtheria and croup during this five-year period is also shown for each sex.

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* Studies in Statistics, Longstaff, p. 336.

† History of Epidemic Diseases of Britain, Vol. II, p. 743.

In view of the various observations of English writers, previously quoted, it is interesting to note that, according to this table, the general mortality rate has been practically the same for both sexes, but slightly higher for males than for females or as 13.2 to 13.0 per 100,000 of population. When the death-rates are studied by age, however, the female death-rate is seen to be distinctly higher than the male rate at ages 5–9 years, 10–14 years and 20 years and upward. At age 4 years also the female rate was slightly higher than the male rate, but at ages under 4 years and at ages 15 to 19 years the male death-rates were distinctly higher than the female rates for the corresponding ages.

The data for the registration area of the United States, for the five-year period, 1910 to 1914, exhibit much the same sex differences as the English

TABLE 21. MORTALITY FROM DIPHTHERIA AND CROUP, ENGLAND AND WALES, 1909–1913

Age at death.	Population.	Deaths.	Rate per 100,000.	Percentage distribution of deaths by age.	
Under 1 year	1,981,051	632	31.9	5.5	
1 year	1,875,220	1,417	75.6	12.3	
2 years	1,985,424	1,474	74.2	12.8	
3 years	1,948,689	1,679	86.2	14.6	
4 years	1,916,328	1,582	82.6	13.8	
Under 5 years	9,706,712	6,784	69.9	59.0	
5–9 years	9,261,522	3,736	40.3	32.5	
10–14 years	8,762,105	621	7.1	5.4	
15–19 years	8,296,798	134	1.6	1.2	
20 years and over	51,436,477	230	0.4	1.9	
All ages	87,463,614	11,505	13.2	100.0	
Females.					Ratio of female deaths to every 100 males.
Under 1 year	1,938,462	468	24.1	3.9	76
1 year	1,848,822	1,259	68.1	10.4	90
2 years	1,972,080	1,328	67.3	10.9	91
3 years	1,948,734	1,607	82.5	13.2	96
4 years	1,909,517	1,627	85.2	13.4	103
Under 5 years	9,617,615	6,289	65.4	51.8	94
5–9 years	9,272,128	4,740	51.1	39.0	127
10–14 years	8,783,777	705	8.0	5.8	113
15–19 years	8,430,820	122	1.4	1.0	88
20 years and over	57,270,561	296	0.5	2.4	125
All ages	93,374,901	12,152	13.0	100.0	98

data, as is evident from the following table:

TABLE 22. MORTALITY FROM DIPHTHERIA AND CROUP IN THE REGISTRATION AREA, U. S., BY SEX AND AGE, 1910–1914.

(Rates per 100,000 Population at Specified Ages.)

Males.

Age.	Population.	Deaths.	Rate.
Under 1 year...	3,337,487	2,523	75.6
1 year.........	2,974,647	5,062	170.2
2 years........	3,262,362	4,555	139.6
3 years........	3,224,000	4,004	124.2
4 years........	3,185,638	3,059	96.0
Under 5 years..	15,984,134	19,203	120.1
5–9 years......	14,377,589	7,278	50.6
10–14 years....	13,793,089	1,598	11.6
15–19 years....	14,314,597	532	3.7
20 years and over........	97,320,276	1,055	1.1
Ages unknown	....	7	....
All ages	155,789,685	29,673	19.0

Females.

Age.	Population.	Deaths.	Rate.
Under 1 year...	3,244,399	2,010	62.0
1 year.........	2,892,390	4,101	141.8
2 years........	3,169,636	4,014	126.6
3 years........	3,177,424	3,419	107.6
4 years........	3,091,757	2,944	95.2
Under 5 years..	15,575,606	16,488	105.9
5–9 years......	14,112,881	7,533	53.4
10–14 years....	13,587,263	1,828	13.5
15–19 years....	14,352,867	539	3.8
20 years and over........	89,416,715	1,335	1.5
Ages unknown	....	18	......
All ages	147,045,332	27,741	18.9

According to this table, the male death-rate from diphtheria and croup was higher than the female rate at ages under five years; the female death-rate was higher than the male rate at ages 5 to 9 years and 10 to 14 years; the rates for the two sexes were practically the same at 15 to 19 years; and the female death-rate was distinctly higher at ages 20 years and over. When all ages are combined the general death-rate of males from diphtheria and croup is shown to have been 19.6 per 100,000 of aggregate male population, against a female rate of 19.3 per 100,000 of aggregate female population.

The higher female mortality from diphtheria at adult ages finds its most likely explanation in the nursing service of mothers, professional female nurses, etc. The higher mortality rate of diphtheria among boys at ages under five years is explainable as following the general rule that the mortality rate of infant and youthful males is higher than that of females, for almost all causes, with the notable exception of whooping-cough. The sex differences in diphtheria mortality are graphically illustrated in the two accompanying charts, I and V, one on page 447, and the other on page 470.

The steadiness of decline in both the male and female death-rates from diphtheria and croup in the United States registration area, during the last fifteen years, and the uniformly higher male death-rates, with the single exception of the year 1914 are two facts made clear in Table 23.

That the attack-rate of diphtheria and croup follows closely the mortality rate in its sex differences seems to be reasonably certain from the Providence, R. I., statistics.* These, quite exceptionally valuable data, have been

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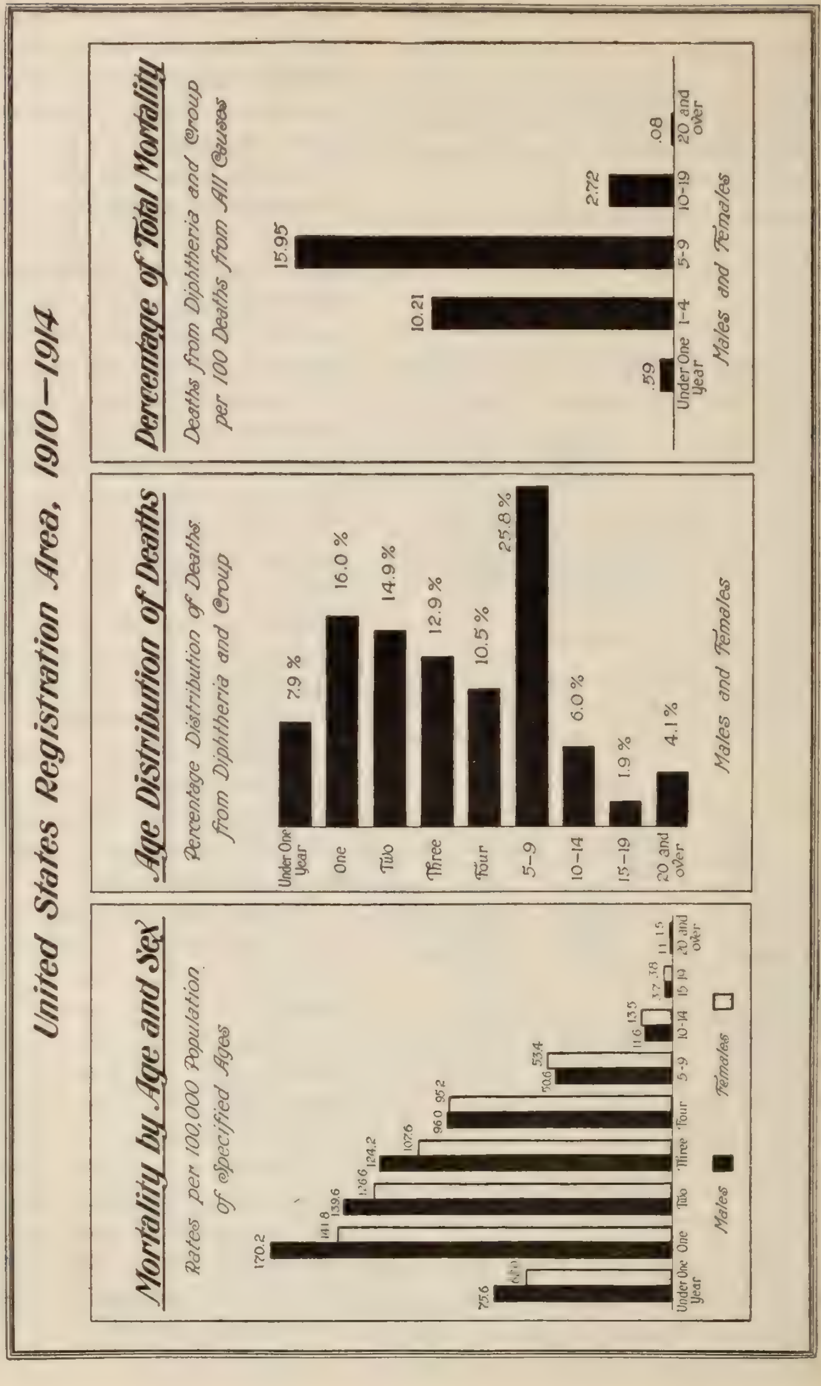
* See Chart I, p. 447.

CHART V.



Mortality from Diphtheria and Croup

United States Registration Area, 1910–1914

TABLE 23. MORTALITY FROM DIPHTHERIA AND CROUP, WITH DISTINCTION OF SEX, UNITED STATES REGISTRATION AREA, 1900–1914.

Year.	Males.			Females.		
	Population.	Deaths.	Rate per 100,000 population.	Population.	Deaths.	Rate per 100,000 population.
1900	15,415,757	6,749	43.8	15,378,516	6,565	42.7
1901	15,742,434	5,346	34.0	15,628,518	5,321	14.0
1902	16,111,848	5,067	31.4	15,917,967	4,792	30.1
1903	16,489,113	5,310	32.2	16,211,970	5,053	31.2
1904	16,856,270	4,827	28.6	16,492,867	4,617	28.0
1900–04	80,615,422	27,299	33.9	79,629,838	26,348	33.1
1905	17,274,352	4,041	23.4	16,820,253	3,998	23.8
1906	21,322,133	5,624	26.4	20,661,286	5,169	25.0
1907	21,899,144	5,329	24.3	21,117,846	4,825	22.8
1908	23,876,529	5,251	22.0	22,913,384	4,801	21.0
1909	26,020,431	5,382	20.7	24,850,087	4,976	20.0
1905–09	110,392,589	25,627	23.2	106,362,856	23,769	22.3
1910	27,606,526	5,971	21.6	26,237,370	5,550	21.2
1911	30,463,411	5,874	19.0	28,812,566	5,390	18.7
1912	31,128,193	5,684	18.3	29,298,940	5,329	18.2
1913	32,607,069	6,213	19.1	30,691,649	5,707	18.6
1914	33,984,487	6,021	17.7	32,004,808	5,765	18.0
1910–14	155,789,686	29,673	19.0	147,045,333	27,741	18.9
1900–14	346,797,697	82,599	23.8	333,038,027	77,858	23.4

compiled for an eighteen-year period, 1896 to 1913, and are presented in Table 24.

The higher diphtheria attack-rate of exposed females as compared with exposed males is quite pronounced at all ages above five years and the higher attack-rate of males is equally pronounced in the first four years of life.

Age.

William Farr as early as 1861 wrote as follows: "In its age incidence diphtheria is very different from croup, which attacks chiefly children of one, two and three years of age, the boys dying in greater numbers than the girls."* In 1894 Thorne stated as follows: "Age affects the deaths in a very remarkable manner, as is shown by the Registrar-General's reports. Taking the proportion of deaths per 100,000, the deaths at different ages under 10, vary from 34 to 70. The moment you pass 15 years of age a change comes, and after 25 years, instead of rates reaching 43, 70, 64 and 70, respectively, they drop to 2, 2, 1, 2

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* Registrar-General's Report, Vol. XIV (1861), p. 217.

TABLE 24. DIPHTHERIA ATTACK-RATE, BY AGE AND SEX, PROVIDENCE, R. I., 1896–1913.—PRIMARY CASES DEVELOPING IN FAMILIES WHERE DIPHTHERIA BACILLI WERE FOUND.

Ages.	Males.			Females.		
	Number exposed, including cases.	number of cases.	Attack-rate per 100 exposed.	Number exposed, including cases.	Number of cases.	Attack-rate per 100 exposed.
Under 1 year....	559	63	11.3	503	47	9.3
1 year..........	533	157	29.5	528	129	24.4
2 years.........	643	256	39.8	577	200	34.7
3 years.........	653	237	36.3	643	208	32.3
4 years.........	713	262	36.7	711	263	37.0
5–9 years.......	3,112	1,071	34.4	3,217	1,210	37.6
10–14 years	2,064	400	19.4	1,984	480	24.2
15–19 years	1,144	127	11.1	1,132	165	14.6
20 years and over	7,283	249	3.4	8,172	416	5.1
Total.........	16,704	2,822	16.9	17,467	3,118	17.9

and so on. Indeed after 25 years of age, diphtheria is a disease which is very little fatal in this country (England). And, more than this, the deaths from diphtheria over that age occur to an important extent among those who are brought into contact with the sick, such as nurses, mothers, and medical men. The greatest age incidence of the disease is between 3 and 10 years of age."*

The mortality statistics of diphtheria and croup have already been presented at some length, with particular reference to their correlation with the sex factor. In the statistics already presented it is clear that in this country as in England and Wales and elsewhere the death-rate from diphtheria is highest at ages 1 to 4 years. The rate drops rapidly after the fifth year of life and it remains low throughout the adult period of life. These facts are most clearly brought out in Table 22, giving the death-rates for the registration area of the United States, by Sex and Age, p. 469.

In Table 25 the attack-rates, by ages of persons known to have been exposed to diphtheria are compared with similar attack-rates of persons known to have been exposed to scarlet fever in the city of Providence, R. I.

The table shows quite a striking similarity in the attack rates of the two diseases at ages under 3 years, then the scarlet fever rates remain higher up to 20 years, at least, when the diphtheria death-rate gains quite a marked ascendency.

The comparatively low mortality from diphtheria in the first year of life has been noted by many writers from

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* The Etiology, Spread and Prevention of Diphtheria, by R. Thorne Thorne, *Journal Sanitary Institute*, April, 1894.

TABLE 25. ATTACK-RATES, BY AGE, PERSONS EXPOSED TO DIPHTHERIA AND SCARLET FEVER, PROVIDENCE, R. I., 1889–1913.

Ages.	Diphtheria.			Scarlet Fever.		
	Number exposed.	Number of cases.	Percentage attacked.	Number exposed.	Number cases.	Percentage attacked.
Under 1 year....	1,612	263	16.3	1,560	283	18.1
1 year..........	1,533	657	42.9	1,421	579	40.7
2 years.........	1,810	991	54.8	1,754	970	55.3
3 years.........	1,901	1,055	55.5	1,949	1,229	63.1
4 years.........	1,952	1,095	56.1	1,859	1,240	66.7
5–9 years.......	8,751	4,323	49.4	8,995	5,619	62.5
10–14 years	5,543	1,725	31.1	5,009	2,047	40.9
15–19 years	3,235	593	18.3	2,761	625	22.6
20 years and over	21,882	1,609	7.4	18,219	833	4.6
Total.........	28,219	12,311	25.5	43,527	13,425	30.8

Bretonneau * in 1859 to Rolleston † in 1916. In Rolleston's practice in London, Eng., out of 2,600 consecutive cases of diphtheria only 20, or less than 1 per cent. were in the first year of life. In the Metropolitan Asylums Board's Hospitals, London, the percentage of cases in the first year of life has varied from 1.5 to 2.8 during the period 1888 to 1914. In Providence, R. I., the attack-rate of exposed persons, aged under 1 year, averaged only 16.3 per cent. against an attack rate of 42.9 per cent. in the second year of life. There have been many theories to account for this apparent immunity but there are exceptions to all of them. From analogy with other diseases of infancy and from statistics of breast-fed infants as compared with the artificially fed, the weight of evidence would seem to favor the theory that diphtheria immunity is favored by breast feeding. A special investigation in Boston revealed the fact that out of 20 deaths of infants from diphtheria all but three were bottle fed. The other three were all Italian children.‡

In the following table the distribution by age of the total deaths from diphtheria and croup in the registration area of the United States during the three years, 1910 to 1912, is compared with the similar distribution of the scarlet fever deaths.

It is shown that nearly eight per cent. of all the deaths from diphtheria occurred at ages under one year, against about five per cent. for scarlet fever. It must be remembered, however, that the case fatality of diphtheria is quite exceptionally high at all the early ages and particularly so at ages under one year. In London, during the five years, 1910 to 1914, the case

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* Memoirs on Diphtheria, New Sydenham Society, 1859.

† Diphtheria in the First Year of Life, *American Journal of Diseases of Children*, July, 1916.

‡ Trans. 15th International Congress on Hygiene and Demography, Vol. VI, p. 187.

TABLE 26. COMPARATIVE MORTALITY FROM DIPHTHERIA AND CROUP AND SCARLET FEVER, BY AGE AT DEATH, REGISTRATION AREA, U. S., 1910-1912.

Ages at death.	Diphtheria and croup.		Scarlet fever.	
	Number of deaths.	Distribution on basis of 1,000 deaths, all ages.	Number of deaths.	Distribution on basis of 1,000 deaths, all ages.
Less than 1 day	3	0.1	3	0.2
1 day	8	0.2	3	0.2
2 days	12	0.4	4	0.3
3 to 6 days	36	1.1	4	0.3
Less than 1 week	59	1.8	14	0.9
1 week	66	2.0	18	1.2
2 weeks	70	2.1	13	0.8
3 weeks but less than 1 month	58	1.7	14	0.9
Less than 1 month	253	7.5	59	3.8
1 month	167	5.0	20	1.3
2 months	131	3.9	24	1.5
3 to 5 months	403	12.0	115	7.4
6 to 8 months	644	19.1	209	13.5
9 to 11 months	1,045	31.0	335	21.6
Under 1 year	2,643	78.4	762	49.1
1 year	5,438	161.4	1,725	111.1
2 years	5,069	150.4	2,236	144.0
3 years	4,469	132.6	2,139	137.7
4 years	3,477	103.2	1,622	104.4
5 to 9 years	8,549	253.7	4,353	280.3
10 to 19 years	2,671	79.3	1,756	113.1
20 years and over	1,378	40.8	937	60.3
Total, known ages	33,694	1,000.0	15,530	1,000.0

fatality percentage of males aged under one year was 23.9 and for females 28.5; in the second year of life the percentages were, males, 19.6, and females, 20.8; in the third year of life the case fatality had dropped to 11.3 per cent. for males and to 12.3 per cent. for females. With advancing age the case fatality rates decline rapidly in diphtheria just as this is the case in measles, whooping-cough and scarlet fever.

The principal facts relating to age as a factor in diphtheria are set forth graphically in Charts I and III, pages 447 and 470.

Complicating Diseases.

There are so many interesting points in diphtheria mortality and morbidity that it would be hopeless to attempt to deal with all of them, even briefly, in a single paper. The question of complicating diseases is too important, however, to be entirely left out of account. Perhaps this feature has been best recorded statistically in the annual reports of the Metropolitan Asylums Board, London. In the following table are presented exceptionally interesting data for 49,308 completed cases of diphtheria treated in the Metropolitan Asylums Hospitals during the ten-year period, 1905 to 1914. Albuminuria was a complicating factor in one-fourth of the cases and paralysis in one-eighth of the cases. Other comparatively frequent complications were otitis, scarlet fever, adenitis, bronchopneumonia, lobar pneumonia, measles, chickenpox, nephritis and whooping-cough.

In the Industrial mortality experience of the Prudential Insurance Company of America during the two years 1914 and 1915 the secondary complications were as exhibited in Table 28, p. 476.

Heart diseases are shown to have been by far the most important, numerically, of the secondary complications, totalling 296. Respiratory diseases were complicating factors in 277 cases; scarlet fever in 121 cases; urinary diseases in 98 cases; and measles in 51 cases.

Diphtheria was itself a secondary complicating cause in only six cases in this same experience. In four of these cases typhoid fever was the primary cause and in two cancer was the primary cause.

GENERAL CONCLUSIONS.

Diphtheria as a cause of sickness is perhaps as prevalent today from the viewpoint of its world-wide distribution as it has ever been in the past. There is reason to believe that it is still spreading geographically and tending to become endemic in the more remote sections of the earth.

TABLE 27. INCIDENCE OF COMPLICATIONS AMONGST COMPLETED DIPHTHERIA CASES, 1905–1914. METROPOLITAN ASYLUMS BOARD, LONDON, ENG.

Complications.	Number.	Number per 1,000 diphtheria cases.
Albuminuria	12,369	250.9
Paralysis	6,135	124.4
Otitis	2,371	48.1
Scarlet fever	2,203	44.7
Adenitis*	1,658	33.6
Bronchopneumonia	593	12.0
Measles	436	8.8
Relapse of disease	419	8.5
Chickenpox	347	7.0
Nephritis	299	6.1
Pneumonia, lobar and unqualified	225	4.6
Whooping-cough	202	4.1
Rubella	106	2.2
Mastoid abscess	56	1.1
Mumps	36	0.7
Tonsilitis	11	0.2
Erysipelas	10	0.2
Jaundice	3	0.1
Tuberculosis	2	0.1
Bronchitis	1	0.0
Enteric fever	1	0.0
Influenza	1	0.0
Stomatitis	1	0.0
Total complications	27,485	557.4
Total completed cases	49,308	......
*Adenitis	1,658	33.6
Suppurative adenitis of acute stage	176	3.6
Suppurative adenitis of convalescence	230	4.7
Simple adenitis of convalescence	1,252	25.3

Antitoxin is the principal curative agent and its value will increase as the technique of its use is improved and its administration becomes more prompt and universal. There is much

TABLE 28. DIPHTHERIA MORTALITY, INDUSTRIAL MORTALITY EXPERIENCE, THE PRUDENTIAL INSURANCE COMPANY OF AMERICA, 1914-1915.—INCIDENCE OF SECONDARY COMPLICATIONS.

Diseases.	Total.	Under 5 years.	5–9 years.	10–19 years.	20 years and over.
Uncomplicated	2,834	1,406	1,081	261	86
Smallpox	1	1	..	..	..
Measles	51	40	9	2	..
Scarlet fever	121	62	38	15	6
Whooping-cough	12	9	2	..	1
Influenza	3	3	..	..	..
Dysentery	2	1	..	..	1
Erysipelas	1	..	..	..	1
Other epidemic diseases	1	..	1	..	..
Septicemia	19	6	11	2	..
Tuberculosis	3	..	..	1	2
Pott's disease	1	..	..	1	..
Acute rheumatism	2	..	2	..	..
Diabetes	1	..	..	..	1
Leukemia	1	..	..	1	..
Anemia	1	1	..	..	..
Other general diseases	6	2	3	..	1
Encephalitis	2	1	1	..	..
Meningitis	5	1	3	..	1
Cerebrospinal meningitis	2	2	..	..	..
Cerebral hemorrhage	1	1	..	..	..
Paralysis	18	8	8	1	1
Convulsions	5	3	2	..	..
Neuralgia-neuritis	4	2	1	1	..
Other nervous diseases	1	1	..	..	..
Diseases of ears	1	..	..	1	..
Pericarditis	2	2	..	..	..
Acute endocarditis	230	65	123	33	9
Organic heart diseases	62	17	23	13	9
Angina pectoris	2	..	1	1	..
Disease of arteries	1	1	..	..	..
Embolism	2	..	2	..	..
Disease of lymphatic system	3	2	1	..	..
Other circulatory diseases	5	3	1	1	..
Diseases of nasal fossae	1	..	1	..	..
Diseases of larynx	20	8	12	..	..
Acute bronchitis	8	6	2	..	..
Chronic bronchitis	2	..	1	1	..
Bronchopneumonia	170	133	30	7	..
Pneumonia	54	33	15	3	3
Pleurisy	2	..	..	1	1
Pulmonary congestion	19	9	5	3	2
Asthma	1	..	1	..	..
Diseases of mouth	2	2	..	..	..
Diseases of pharynx	25	7	10	7	1
Diseases of stomach	7	1	5	1	..
Diarrhoea-enteritis	20	10	6	2	2
Appendicitis	2	..	1	..	1
Hernia	1	..	1	..	..
Other Intestinal diseases	3	2	1	..	..
Liver diseases	1	1	..	..	..
Peritonitis	1	1	..	..	..
Acute nephritis	56	16	31	9	..
Bright's disease	40	10	22	6	2
Other kidney diseases	2	1	..	..	1
Diseases of uterus	1	..	..	1	..
Other accidents of labor	1	..	..	..	1
Acute abscesses	4	..	1	2	1
Diseases of bones	2	..	1	1	..
Senility	1	..	..	..	1
Ill-defined organic diseases	2	2	..	..	..
Sudden death	1	..	1	..	..
Not specified or ill-defined	65	17	30	14	4
Totals	3,920	1,899	1,490	392	139

evidence that if quicker positive diagnosis can be had antitoxin will become a much more powerful curative weapon than it now is in most of the cities, towns and rural areas of the world.

The specific cause of diphtheria being well known and a curative agent having been discovered it now remains to find some practical means of removing or effectually opposing the underlying conditions favorable to the spread of the disease. The Schick test has made it possible to readily detect persons susceptible to the Klebs-Loeffler bacillus and the temporary immunization of exposed persons by preventive dosage with antitoxin is probably the most important recent development in the scientific efforts to prevent the spread of diphtheria.

Finally, however, it must be admitted that many of the possibly very important underlying conditions favorable to the development and spread of diphtheria are not well understood, if known at all. The comparative importance of temperature, rainfall, altitude, drainage, etc., the possible variations in the virulence of the diphtheria germ under varying conditions of time and place are among the factors which require more extensive research than has thus far been possible. In these inquiries the statistical method is likely to prove a helpful supplement to the methods and work of the bacteriologist and pathologist.

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THE PRESENT STATUS OF THE SCHICK TEST.

In an article appearing in the April *Health News* of the New York State Department of Health, entitled "The Present Status of the Schick Test and Active Immunization with Diphtheria Toxin-Antitoxin," by Dr. Abraham Zingher, the author derives the following summary and conclusions:

"1. The testing of children with the Schick reaction on a large scale in the homes, schools and institutions can be readily accomplished, and a permanent record should be kept of the results. From the results which we have obtained, we feel certain that the majority of children, who have passed their second year of life and show a negative reaction, are protected for years and probably for life.

"2. The data that we thus obtain will represent valuable facts, both for the individual and the community.

"3. For the individual the assurance of an immunity to diphtheria will be of great value. If susceptible, he can be actively immunized with three injections of toxin-antitoxin. Schick retests should subsequently be made to determine the success of the protection obtained.

"4. For the community, with an increasing knowledge of the number of permanent immunes, and the selection and immunization of the susceptible ones, we may finally be able to control a disease which continues to be one of the big issues of preventive medicine. The failure so far has been made especially evident by our attempts to deal with the problem of the bacillus carrier. It will probably not be by the elimination of the bacillus carriers, but rather by the active and possibly permanent immunization of the susceptible individuals in a community that we will prevent fresh cases of infection and, to some extent at least, the development of new foci for the dissemination of virulent diphtheria bacilli."

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THE INSTITUTE OF HEALTH OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

During the past few years the American Public Health Association has endeavored in various ways to increase its effectiveness as a force to bring about improved health conditions. Its major effort has been directed towards the publication of the AMERICAN JOURNAL OF PUBLIC HEALTH. This JOURNAL, now in its seventh volume, has been able by dint of much work and generous gifts by members of the Association and a few non-members to firmly establish itself. It has now become indispensable to the thoughtful health worker in every branch of the subject. Many members of the Association and subscribers to the JOURNAL have been kind enough to express their appreciation and approval, and this approbation has acted as an added stimulus to the management for further improvement.

The annual meetings of the Association have also increased in effectiveness and far reaching importance; larger attendances have been recorded, and great interest and enthusiasm evinced.

Lack of funds has prevented the development of additional work on the part of the Association, although for a long time many of the members have felt that the Association should take a greater and more direct part in the public health activities of the countries represented in it.

A Health Information Bureau and a Health Employment Bureau have recently been established, and although these activities have been limited from necessity, the office has come to realize that both of these new services are actually fulfilling a definite need, and that they should be developed to perform greater usefulness.

The Executive Committee of the Association during the past two years, and earlier the Committee of Seven, have endeavored to raise sufficient funds to enable the Association to undertake constructive work in new fields where assistance was needed. And so it is with particular pleasure that the Executive Committee of the American Public Health Association is able to report that the Metropolitan Life Insurance Company has expressed its willingness to spend $25,000 in publishing pamphlets and forms prepared by the Association along lines which justify the company in relation to the health of its policy holders.

It is planned that this money shall be budgetted on a two year basis, and the Executive Committee, after careful deliberation, has decided to create a special bureau to be known as the Institute of Health of the American Public Health Association. This institute is to be a Bureau of Information and Assistance, and will take over the existing information and employment bureaus and develop them. In addition, the new Institute is to create and develop a special service, particularly intended for the benefit of the health authorities of the smaller communities. It is planned that a regular educational service be established, which shall issue at regular intervals bulletins of a strictly practical nature, peculiarly adapted for the untrained and more or less inexperienced health officer, sanitary inspector, and community health worker.

In addition to this regular service, the Institute will be prepared to assist and advise local health authorities on special questions and problems dealing with health administration and public health practice; to supply lecturers and general propaganda where possible, in order to aid in the creation of a public conscience in connection with the establishment of needed health reform.

It is planned ultimately to develop regular correspondence courses particularly for the more subordinate officers of the modern health department, or for men and women who are planning to enter the health field. It seems most reasonable to presume that from such a beginning there may arise a process of examination and certification, similar to that practised by the Royal Sanitary Institute of England. Such certification, while entirely of an unofficial character, should rapidly demonstrate its usefulness and should become a desideratum on the part of ambitious and interested sanitary inspectors.

It is therefore with the utmost gratification that the Executive Committee is able to announce the advent of the American Public Health Association into greater fields of activity and usefulness, and to thus establish a more direct working basis for the extention of its influence in the great service of public health activity.

THE SANITARIAN AND WAR.

Ever since it was officially recognized that a state of war existed between the German Empire and the United States, the patriotic men and women of America have been asking themselves what they could do toward the successful prosecution of the war. Many have found this an extremely difficult question to answer. We have not entered the war in anger but in defense of principles which we believe to be as just as they are universal in their application. Thus far, so far as the United States is concerned, the war has existed entirely on paper, and we have not been stimulated by the call which comes from danger or from anger. Modern war is peculiar in that it is carried on not only by those individuals who compose the destructive combatant forces but also by the industrial constructive combatants who perhaps never hear a gun fired or see a wounded man. In other words we know that more than ever before in the history of the world war is fought with brains and stamina and is not confined to the firing line alone. Therefore the educated American feels that there is need for his services, but at the outset he is confronted with the necessity of choosing in which of the classes of combatants he can render the most efficient aid. We, as sanitarians, must face this question and answer it, each for himself.

In the last analysis, the thing which will win this war, so far as the United States is concerned, is the health of the American people. Our courage, our virility, our staying power, our ability to produce foods and other munitions of war, both for ourselves and for our allies, is absolutely dependent upon this. There is no military necessity which is more important than the maintenance of a healthy people. War but serves to increase the importance of health and doubles the responsibility which is placed upon us as the health wardens of the general public. Aside from this, the collection and movement of large bodies of men, which, in the beginning at least, will consist largely of raw, irresponsible levies, the increased speed and pressure which will be demanded of labor, the relative scarcity and consequent rise in prices of the necessities of life, all will but serve to make the sanitary problem more difficult. Already, a considerable number of medical men engaged in the practice of sanitation have been commissioned. Large numbers of sanitary engineers have taken service in the engineer corps. This means that an additional burden has already been thrown on the remaining sanitarians. This requires increased vigilance of those who have not entered the strictly military services, and but serves to accentuate the importance of the sanitarian who stays at home.

That this war may bring forth hitherto undreamed of sanitary problems is entirely probable. Many of these problems will have a direct bearing upon the health of armed troops; others will be related to the health of the industrial forces which must be maintained in order that the fighting man may be fed and at the same time spared the danger of communicable disease from the civil community. When these special problems arise, trained specialists will be required to solve them. The sanitation of food supplies alone may require the combined services of several laboratories. The problems of alcohol and the venereal diseases, the control of tuberculosis, typhoid, and particularly measles, may, in certain instances, tax very heavily civilian health agencies.

No practising sanitarian who, by reason of age or physical incapacity, is obliged to stay at home, need feel himself a "slacker" if he discharges thoroughly the duties of his position. There is work enough to go around with the Army, the Navy, and the Public Health Service. Until we are called to the colors, however, let us bend our every effort to the promotion of the public health, in the full realization of its vital necessity at the present time. The destructive side of war must of necessity go forward, but in the excitement of military preparation let us not forget that it is health and the other constructive forces of the body politic which will win this war.

Herbert W. Conn, Ph. D.

Born January 10, 1859. Died April 18, 1917.

Prof. Herbert W. Conn of Middletown, Conn., died April 18, 1917. Doctor Conn was Professor of Biology, Wesleyan University, and in this connection organized the State Board of Health Laboratory in 1905 and continued as its director until the time of his death. In March, 1911, he was appointed by the New York Milk Committee as a member of the National Commission on Milk Standards and since then has given freely of his time and talents to the work of this commission. His interest in milk as a scientist was exceeded only by his humanitarian interest in standardizing milk to prevent unnecessary loss of infant life.

He was a director and a member of the Executive Committee of the American Public Health Association, and was affiliated with many other scientific organizations.

As a man of sterling character, as a pioneer health worker and as a scientist of national repute, we deeply mourn his loss.

U. S. ARMY METHODS OF DISPOSAL OF CAMP REFUSE.

JAMES M. PHALEN,
Major, Medical Corps, United States Army.

IT WILL not be possible within the compass of this paper to indulge in any discussion of the many possible methods of camp refuse disposal. It will be the aim only to direct attention to a few procedures that have proven their value under certain conditions of camp life, and perhaps to mention a few others which might prove more satisfactory under different conditions. The subject naturally divides itself into the disposal of kitchen and camp area refuse, of manure and of human excreta and these items will be taken up in order.

KITCHEN REFUSE.

For a camp of anything but the shortest duration the destruction of kitchen refuse by burning is the only method to be considered. And to do this some form of a kitchen incinerator must be constructed. A description of the details of any of the many types of incinerator will not be attempted but only general principles of their construction given.

The first essential is an excavation in the ground quadrangular or oval about 6 feet by 3 and preferably as much as 4 feet deep. This is filled loosely with large stones, broken brick or other material which will conserve heat. The dirt taken from the pit is banked along the sides to the height of about a foot and this sloping banking is paved with stones, the ends being left without banking in order to increase draught. Upon this incinerator a wood fire is kept constantly burning and onto the heated stones is dumped all the refuse from the kitchen. By pouring the liquid refuse slowly and evenly over the heated stones, a great part will be taken care of by rapid evaporation and the remainder ordinarily by seepage into the ground. With a relatively impervious soil it is necessary to furnish the incinerator with evaporating pans for the liquid. Solid kitchen refuse is readily dried and consumed upon this incinerator.

Such an incinerator as described above is furnished for each company kitchen and not only is consumed thereon all kitchen wastes from the organization, but also all camp refuse from the camp area of the company. This includes the sweepings of the tents and the litter which has accumulated in the company street. Police of the camp begins at the back line and the police party work forward toward the kitchen line and the accumulated rubbish is thrown upon the incinerator to be consumed. The ultimate disposal of the refuse from the incinerators requires that there be selected immediately upon the establishment of the camp a convenient site for a refuse dump and that no dumping be permitted elsewhere. By putting a non-commissioned officer in charge of this dump with a couple of civilian laborers to keep it leveled off and to maintain a road across it, large quantities of such refuse can be dumped upon a small area. By this method an average of thirty wagon loads a day for twenty months was dumped upon an area of practically one acre.

Manure Disposal.

The collection of manure from the picket lines should be practically continuous during the day. Beginning with the morning police when the bedding is removed and set aside to sun and dry and the night droppings swept up and carted away, attendants should be on duty on the picket lines to prevent accumulations of wet manure under the horses' feet. It is only necessary at the time that it be up in piles to facilitate drying. Daily removal of manure from the vicinity of the picket lines is sufficiently often.

The satisfactory disposal of manure is always difficult and likely to be expensive. Much depends upon the amount to be disposed of. It may be confidently stated that manure will furnish flies to a camp from any distance to which it may be economically hauled by wagon, if it is not further treated. It would appear to be highly desirable that arrangements be made with associations of nearby farmers so that the manure could be placed upon flat cars conveniently set for the purpose to be transported where needed for fertilizing purposes. In the absence of such an arrangement resort must be had to burning. The use of chemicals such as borax or iron sulphate, while entirely satisfactory in the prevention of fly breeding in small quantities of manure, would be impracticable here. The following method has proven satisfactory to the writer in a camp containing about 4,500 animals and which furnished about 100 wagon loads of manure daily:

A site for the dump was marked off, 1,000 yards long by about 80 yards wide. The manure was dumped in winrows running across this area. These winrows were made by dumping the manure from the tail of the wagon as it was gradually moved across the dumping area. The winrows were about 18 inches high in the middle and of the width between the wagon wheels. Practically all of the manure was hauled out early in the forenoon and much of it was quite wet. It was necessary to let it stand for a few hours so that the surface at least would be dry. On this dump six civilian laborers were employed. They sprinkled the windward side of the winrows with crude oil and set them afire. Thereafter they were occupied in turning the manure with forks in order to keep the fires burning and to bring the more wet part to the surface for the action of the sun. In the burning of this amount of manure from three to five barrels of crude oil a day were required, depending upon the amount of wind blowing.

This method of disposal was satisfactory except during prolonged wet weather when burning was rendered impossible. Such periods were invariably followed by a plague of flies a week or ten days later.

A side line of this dump was the disposal of dead horses and mules many of which would be furnished by a camp of this size. Near the manure dump a hole about 15 feet long by 10 wide was dug to a depth of about 4 feet. Orders were given by the camp commander that dead animals taken to the dump for disposal should be accompanied by half a cord of wood. This wood piled around and on top of the horse with a couple of buckets of crude oil poured over it would furnish fuel for the speedy cremation of the animal. A score or more of animals can be burned in such a pit before there is any necessity of removing the ashes and remaining bones. It is an advantage to burn a number of animals in the same pit as each succeeding cremation aids in the disintegration of the remaining parts of those previously burned.

DISPOSAL OF HUMAN EXCRETA.

No one will question the advantage, where such is to be obtained, of having a sewerage system installed in camp and the excreta disposed of by water carriage. Unhappily this is rarely practicable. Excreta incinerators had a short vogue but they have had their day. They had disadvantages not to be discussed here. The experience of the Maneuver Division at San Antonio in 1911 supplemented by that of the Second Division Camp at Texas City in 1913–14 has firmly fixed the position of the deep pit latrine as the method of widest general application to camp conditions. Simply stated this is only a deep pit with a fly tight box, with proper care given to its maintenance. The pit is usually dug about 8 feet deep if possible, 18 inches to 2 feet wide and should be 18 or 20 feet long for a company latrine. The box should be constructed of seasoned tongue and groove or shiplap material so that no cracks will result to permit flies or even light to enter the pit. It should have two running feet for each hole, with an additional foot at each end. Thus a company box should be 18 feet long and furnished with 8 holes. The covers should close the holes tightly, be constructed so that they cannot warp and the back of the box should be furnished with a rail so set that the cover could not remain open when the hole was unoccupied. Around the edge of the pit is placed a frame of planking upon which the box is set. As the box must be removed for a daily burning of the pit, the box must be light enough to be turned back by no more than two men. In front of each hole should be nailed to the upper angle a piece of tin, 8 x 12 inches, shaped into a gutter and so placed that it will divert the urine back so as to clear the anterior wall of the pit. The latrine should be not only enclosed at the side but it should be well roofed. This adds much to the comfort of the occupants and prevents flooding and caving of the pit during heavy rains. As a further protection the inclosure should be well ditched at a distance of a foot from the walls and the roof should extend sufficiently far beyond the walls to deliver storm water into these ditches.

The principal item in the care of the latrine is a daily burning out. For this purpose the box is turned back and a layer of hay or straw is thrown into the pit which is sprinkled with crude oil and set afire. The usual allowance for this purpose is one gallon of oil and 14 pounds of hay per day for each latrine. After the hay is consumed and the fire has burned out the box is restored to its place and made tight again. It is usually necessary to make the joint between the box and the base tight by banking up with a little earth.

It is evident that the object of burning out the latrine pit is not the incineration of its contents. Certainly such a result is not obtained. What is accomplished is the production of a charred layer over the excreta which renders it unattractive to flies. Fly larvæ near the surface are probably killed. To accomplish the object of rendering the latrine pit unattractive to flies a new method was given a tryout on the Mexican border last summer. I am not sure to whom is due the credit for having originated the idea. It first came to my notice from a militia medical officer of New York. The method consists in spraying the interior of the pit daily with a suspension of lamp black in coal oil. It has the advantage that it can be applied through a hole thus avoiding the necessity of removing the box. After a limited experience with the method I am of the opinion that it has decided value and I understand that a board which investigated its merits was of the opinion that it was more effective than the older method of burning.

It is necessary to make provision for the collection and disposal of night urine, this to prevent the contamination of the ground of the company streets. For this purpose there are placed in each company street as accessible as possible to the greatest number, two galvanized iron cans, whitewashed to render them the more conspicuous and usually further to be easily located by the presence of a lighted lantern. The contents of these cans are emptied each morning into the latrine pit, the cans are burned out with the aid of a handful of hay and a dash of crude oil, a layer of whitewash is applied to the outside and it is turned bottom up until again needed.

It is not to be understood that these procedures inaugurate themselves or that they ever become automatic in their action. The methods to be followed are specified in a general way in the Sanitary Order, one of the very first general orders issued after the establishment of a camp or even when such an establishment is contemplated. With this general order as a basis, regimental commanders and others issue orders in the necessary detail. And after the provisions of the sanitary order have been put into operation it devolves upon the sanitary inspector to keep them in efficient operation. There is too much ignorance and indifference to be overcome and too much willful disobedience to be combated for the vigilance of the sanitary inspectors to be relaxed no matter how long the camp may be in existence or how sanitary its appearance may be at a given inspection. With the application of such sanitary measures as I have outlined, supplemented by competent inspection, and with good shelter and intelligent preparation of the food ration provided, there is no reason why troops may not be kept for indefinite periods in camp with sick rates as low as those of troops houses in the most modern of barracks.

EXAMINATION OF RECRUITS FOR THE ARMY AND MILITIA.

Harry D. Orr,
Major, Medical Department, First Regiment Illinois Cavalry, Chicago, Illinois.

IN THE examination of recruits for the regular army and militia the War Department has issued concise and detailed instructions varying in many important details as indicated by the work of the branch of the service in question. Next to the care of the soldier in the field, the most important factor in the attainment of military efficiency, is the proper selection of the recruit. None but the robust and able-bodied must be enlisted because only these can stand the exposure and hardships to which troops are subjected and can acquire the endurance to fatigue and resistance to disease which go to make up the efficient soldier. Delicate or immature young men or those suffering from slight or chronic ailments are easily exhausted and acquire disease readily thereby weakening the ranks they had intended to strengthen and, falling by the wayside when they are most needed, fill the ambulances and hospitals reserved for the wounded and later become applicants for pensions from the government which they have never effectively served. The best possible care will never make effective soldiers of these men who in addition to their own ineffectiveness frequently further deplete the military forces by making it necessary to assign able-bodied men to care for them. For this reason the crime of the physically deficient is doubled.

The percentage of physically unfit from the standpoint of military service is appalling. The verdict of the recruiting medical officer should be a shock to the nation. Ordinarily two to three out of every four applicants for the regular army are rejected as physically unfit. The young man who has dissipated his energies and undermined his health has sinned against his citizenship to an extent for which his atrophic manhood can never atone.

"Applicants for first enlistment must be between the ages of 18 and 35 years, of good character and temperate habits, able-bodied and free from disease, and must be able to speak, read and write the English language." Applicants may be required to satisfy the recruiting officer regarding age and character and should be prepared to furnish the necessary evidence.

While the upper age limit is 35 it is seldom in the interest of the service to enlist men over 30 and experience has shown that under 20 soldiers do not stand well the hardships and fatigue of a campaign. We reach our own greatest physical development between 25 and 30. The so-called veterans of Napoleon's army were from 26 to 28 years and "The Old Guard" was composed of men 28 to 29.

Much is written and said about emptying our jails and reformatories and sending these men to the trenches. As a matter of fact men who have served reformatory or jail sentences will not be accepted. Even petty offenders in civil offenses are not regarded with favor. Only clean, healthy fellows with good records are wanted. The man who does not live up to the obligations of his citizenship in his own community is not fitted to serve the nation. Serving one's country is not a form of punishment but is a privilege of the highest order and only those whose records are clear and whose good citizenship has been proven in ordinary times should be chosen for this supreme test of the nation's manhood.

"For infantry, coast artillery, and engineers, the height must be not less than 5 feet 4 inches and weight not more than 190 pounds.

"For cavalry the height must be not less than 5 feet 4 inches and not more than 5 feet 10 inches and weight not to exceed 165 pounds.

"For field artillery the height must be not less than 5 feet 4 inches and not more than 6 feet, and weight not more than 190 pounds. For the mountain batteries the height must be not less than 5 feet 8 inches.

"A variation not exceeding a fraction of an inch above the maximum height given for cavalry and field artillery is permissible if the applicant is in good health and is in other respects desirable as a recruit.

"The minimum weight for all arms of the service is 128 pounds subject to certain variations below that standard but in no case will an applicant whose weight falls below 120 pounds be accepted without special authority from the adjutant general of the army."

The minimum height in our army is 64 inches while it is considerably lower in some of the armies abroad. In a well proportioned subject strength and staying qualities increase with the height but a maximum limit is soon reached. Very tall men, over six feet, are objectionable because usually the heart and lung power and muscular energy are not increased in proportion to their height, and in addition tall men require more food, more clothing and offer a larger target to the enemy.

Weight is of the greatest importance and considered in connection with the height is a valuable indication of the development of muscles and organs.

Respiratory capacity as indicated by chest mobility is of great importance. An expansion of less than 2 inches is unfavorable. Generally speaking the chest measure at expiration should never be less than 32 inches and should be at least one half the height in inches.

Modern war and the handling of present day weapons make a high degree of intelligence necessary. The recruit of today must be able to think for himself and have a very clear conception of his duties.

The consequences of intemperance in the use of stimulants or narcotics are so great that applicants whose habits in this respect are under suspicion should be rejected. When these matters are in doubt, it is better to reject, for the business of defending and upholding the flag is most important and serious and must not be delegated to those whose physical, mental or moral fitness is in question.

Visual requirements for the line of the army and signal corps are 20/40 for the right eye and 20/100 for the left eye provided that no organic disease exists in either eye. Recruits may be accepted for the line of the army when unable with the right eye to read correctly all of the letters on the 20/40 line provided that they are able to read some of the letters on the 20/30 line. For the ordnance department and for the hospital corps 20/70 in each eye correctible to 20/40 with glasses provided that no organic disease exists in either eye. Color blindness is a bar for applicants of the signal corps.

In the matter of hearing the applicant should be able to hear the whispered voice at 20 feet with either ear. Deafness in either ear rejects although a mild degree in one ear may be overlooked. A discharging ear disqualifies.

"Unless an applicant has at least four serviceable double (bicuspid or molar) teeth, two above and two below, and so opposed as to serve the purpose of mastication, he should be rejected."

Deformities of the mouth interfering with mastication or speech, or enlargement of the tonsils sufficient to interfere with the voice or swallowing, disqualify.

Extensive goitre or of the ophthalmic type or great enlargement of the cervical glands are causes for rejection.

Deformities of the chest which diminish the respiratory function or which show disfigurement when the applicant is dressed, as well as poorly united fractures of the ribs or clavicle, reject.

Chronic bronchitis, pneumonia, pulmonary emphysema, asthma, chronic pleurisy and pulmonary tuberculosis disqualify.

Organic heart murmurs, that is, those accompanied by secondary physical changes, pronounced increase in the pulse rate, or marked irregularity always disqualify.

Any kind of hernia, chronic appendicitis or dyspepsia, gastric ulcer, chronic diarrhœa, or dysentery, and enlargement of the liver or spleen, are cause for rejection.

Hemorrhoids sufficient to produce symptoms, fistula, or marked varicose veins disqualify.

Syphilis in all stages, venereal ulcerations and all forms of gonorrhœa promptly and positively reject.

Varicocele, unless painful or very large, and small hydrocele do not disqualify.

All diseases of the bladder and kidneys and some defects of the urinary organs disqualify.

Total loss of either thumb, loss of any finger except the little finger of either hand, loss of more than one phalanx of the right index finger as well as loss of the terminal or middle phalanges of any two fingers on the same hand disqualify.

Marked curvature of the spine, dislocations or fractures, with incomplete restoration of function, anklyosis of joints or chronic bone inflammations are disqualifying.

Marked knock-knee, excessive bowleg, flat-foot accompanied by symptoms, loss of the great toe or any two toes on one foot, marked hammer-toe, painful bunion, painful corns, particularly on the sole of the foot, webtoes, club feet, ingrown toe nails, "stinking" feet, and severe "sweaty" feet are disqualifying.

For certain departments special requirements are necessary, for instance, in the aviation service, the most exacting tests are made of sight, hearing and nervous system. In picturing to the reader the acceptable candidate for the various branches of army service, a most excellent characterization by Major F. T. Woodbury, Medical Corps, U. S. A., cannot be improved upon.

"The infantryman must have well-formed, well-arched, elastic and strong feet. He must be well muscled and supple, neither adipose nor lean. He must have excellent heart and lungs, in a capacious chest, to supply him in his exertions; a good frame to carry his pack, a good eye to sight his rifle, a good ear to hear the enemy patrol, good teeth to chew, and good digestion to assimilate his plain but nourishing ration. He must be intelligent and have the stamina of manhood in its prime, to bear with triumphant fortitude the hardships of service, neither inclining to the tenderness of youth, nor yet to the submission of age. He must not be so tall as to be a burden to himself, or so short as to be unable to bear his portion of the company duties.

"The cavalryman need not have the frame and musculature of the infantryman, nor be so tall or so heavy, nor does he need such perfect feet and legs. His horse carries him and his pack. He needs suppleness of waist and strength of arm. While he may fight in mounted charges, he usually fights on foot in positions consecutively distant, whither he rides, and in formations usually near where his horse is held. He needs a keen eye and ear for scouting and patrols and he may be of younger age than the infantryman, as his service calls for dash and reckless daring in swift action, which is ever the delight of youth.

"The field artilleryman combines the functions of the foot and mounted troops, according as to whether he serves with a mountain, horse, or light battery.

"The coast artilleryman leads a more sedentary life than the preceding. His duties are laborious, but they are performed amid surroundings and under circumstances akin to many vocations in civil life. He is not ordinarily exposed to the hardships of short rations, nor required to endure the rigors of inclement weather continuously, without sufficient shelter or dry clothing, nor is he required to undergo forced marches as a preliminary to personal combat with the foe. He must have a well-built frame, of good height and well muscled. He need not be so agile and except under certain circumstances, where men are selected for special duties he does not need keen vision nor hearing; indeed, if we have the latter, the concussion of big-gun firing will soon render him hard of hearing. He must not be a stripling nor yet so old as to be incapable of training himself to his special duties.

"The aviator requires excellent vision and hearing, a sound heart and lungs, resilient arteries, mental poise combined with supreme courage, to enable him to endure the great barometric and meteorologic changes in his flights and daring, to maneuver his plane and his guns amid the clouds, or drop bombs or act as an aerial scout, scanning the enemy's movements."

THE PRINCIPAL DEFECTS FOUND IN PERSONS EXAMINED FOR SERVICE IN THE UNITED STATES NAVY.

CHARLES A. COSTELLO,
Assistant Surgeon, Medical Reserve Corps, United States Navy.

AT THE present time when the United States is in the midst of a world conflict as an active participant and Congress is about to enact a bill which will call to the colors the youth of the country for the purpose of giving them an extensive military training for the future part our forces are to play in the trenches which comprise the battle lines of the old world, or upon the seas with our fleet, it has occurred to me that a brief résumé of the physical defects which are the chief causes of rejection, together with the reasons therefore, may be of some help to the physician in civil practice who will be called upon by the government to help in securing the right kind of men when this bill becomes a law and is put into force.

It is unnecessary for me to say that a large percentage of these recruits drawn from all the conditions and walks of life will be found unfit for active military service, and if our present standards are maintained, which they no doubt will be, fully 50 per cent. will be disqualified and turned back to civil life.

Malingerers and slackers will take every advantage of their small disabilities; and, unfortunately, will be aided by unscrupulous members of our own profession, in their efforts to shirk their responsibilities to their country. It is purely up to the medical examiner to determine whether a man is fitted for service or not, and, if in his judgment the recruit is qualified, he should be accepted and forced to do his bit, regardless of any outside pressure brought to bear. It is also his duty to advise those disqualified, who are willing to serve, the proper steps to be taken to fit themselves for such service.

The purpose of this paper is to present in the order of importance, the most prominent and frequent physical defects met with in the examination of men applying for enlistment in the Navy. The first and commonest of all these is defective vision. Fully 35 per cent. of the total number of rejections in the recruiting offices are due to this cause; and it is a surprising fact that the majority of these are men who were unaware of any abnormality in their eyes until they failed to read the eye card at the minimum distance required, viz.: 15 feet. Men, with vision less than 15/15, are not of any use in the Navy, as in this branch of military service, a man must have two good eyes, and be able to see without the aid of glasses; which, while they may be perfectly fitted, are subject to accidents such as the breaking of a lens, fogging in a rain or mist, glare in the bright sunlight, etc. A ship and the lives of its crew depend entirely upon the eyes of the men; so it can readily be seen a visual mistake is a serious matter, and can only be avoided by the absolute maintenance of the standard required by the Navy regulations. Before leaving this subject, I wish to suggest that the vision test is the easiest, and also the means most frequently resorted to by those individuals who desire for selfish or other motives to be disqualified in the physical examination and in this way avoid doing their duty. The utmost care must be taken by the examiner to preclude the possibility of any imposition being practised on him, and if his suspicions are aroused, a thorough test by a competent oculist should be made before a man is finally disqualified.

The second cause of rejection, and one of the greatest importance in my opinion, is pes planus, or flat feet. This condition, I believe is in a way a mistermed defect. I think some distinction should be made between a physiological flat foot, the type of foot most frequently seen, and the foot in which the arch is broken down. Physiological flat feet are characteristic of some races, especially those who do not wear shoes and are commonly seen in the white race as well. They seldom cause any trouble, and as far as the individual is concerned, he probably never is aware his feet are different from other men's until he reaches the recruiting office. In making examinations of an applicant's feet, it is well for the surgeon to show as little concern as possible, and keep his findings to himself if he intends to accept the applicant, for this reason, should the man enlist and later become dissatisfied with the service, he will immediately begin to complain of his feet and take this means of securing his discharge by medical survey.

The man with feet in which the arches are broken is useless as far as active military service is concerned, for he is not only unable to perform his work aboard ship where he is constantly on steel decks, but when ashore as a member of a landing force he is unable to walk any great distance without discomfort; and consequently will always be found among the stragglers. This type of foot is always a cause of permanent rejection and unless it is painful and causes difficulty in getting around, no advice is necessary.

The third and next important cause for rejections is defective teeth, which in itself is surprising when one takes into consideration the number of dentists in this country. Nevertheless, 27 per cent. of the rejections at the recruiting stations are for teeth which have been neglected until their condition is such that they are beyond possibility of repair. The minimum requirements of twenty sound teeth, of which there must be four opposing molars and four opposing incisors, with crown and bridge work counting as sound teeth, are fair, and a man's mouth could hardly be considered in good condition without conforming to this requirement. A peculiar coincidence I have noticed in the examination of applicants who have defective teeth is the frequency that defective vision is present in the same individual; from this I am led to believe that the man, with a mouthful of decayed teeth, develops a toxin which in some way is partially responsible for the condition of his eyes. Teeth, as we now understand them, are the cause of many of our ills, and as it is necessary for a man in the Navy to be in a constant state of good health his teeth must be in a good condition, otherwise, he is a victim of his own toxins; and living, as he necessarily has to, in confined quarters aboard ship he is less resistant to outside infections, as well as a menace to other members of the crew, through common use of the same drinking fountains and as a bacteria carrier. Men of this character are not desirable and must be rejected temporarily until they have the proper dental work done.

The foregoing causes of rejection are the three cardinal offenders met with and are ever present to such a degree as to disqualify more applicants than all other defects combined. Unfortunately, the former and the latter are conditions which undoubtedly play a great part in the early life of a young man, and with little effort could be remedied, thereby saving many boys, considered backward in school, the handicap of going through life with a meagre education, while their fellows who have had the advantage of proper care and treatment are able, because of their better state of health, to embrace every opportunity offered them. There is, I believe, a wide field for this sort of work in our schools and municipal health departments.

Another, but not so frequent a cause of rejection is defective hearing, due to perforations of the tympanum, inflammatory conditions of the Eustachian canal, impacted cerumen, etc. Perforation of the tympanum, of course, is permanent, producing a diminution of the auditory sense, and consequently is always a cause of rejection. Inflammations of the Eustachian tube may possibly be remedied to some extent, but I have seldom seen a case in which normal hearing—namely, ability to hear the whispering voice at fifteen feet or a ticking watch at forty inches—is restored sufficiently to enable a man to pass this standard test. Impacted cerumen is a minor condition and can readily be relieved, if the applicant will follow instructions.

Color blindness is another frequent and very important cause for rejection. In the Navy, especially, a man must have perfect color perception, and any signs of hesitancy or doubt he may display in selecting various color skeins must be carefully observed. Individuals with this defect are not safe men at sea, as can be readily understood when one considers that a fatal mistake may be made by a man who cannot distinguish between a red and a green light. There is, however, another very common condition, namely, color ignorance. For this, I can see no reasonable excuse, and I am convinced it should never occur if proper instruction had been given in the schoolroom.

Hernia and hydrocele are common, and while they are both a cause for permanent rejection, the recruit should be advised that a simple surgical operation will cure either one. Varicocele is of importance only when it is large, and as that also can be cured a minor operation should always be advised. The same is true to hemorrhoids. I find that proper explanation of these operations, the length of time necessary for recovery and the positive assurance the result will be permanent, is all that is necessary to send these men in search of a hospital and a surgeon, and at least 75 per cent. return and are enlisted in the Navy.

In conclusion, I desire to say that I have not attempted to cover the entire field of recruiting, from a medical officer's point of view, but rather from the standpoint of one interested in a hygiene problem which seems to me, if my experience is of any value, has been overlooked by persons entrusted with the welfare of our American youth, and I hope, since universal training has come to stay, physical requirements necessary to maintain the high standards of our forces will be better understood.

DISPENSARY PROBLEMS OF GONORRHEA AND SYPHILIS.

Alec N. Thomson, M. D.,
New York City.

Read before the Section on Public Health Administration, American Public Health Association, Cincinnati, Ohio, October 25, 1916

A CLINIC in venereal disease from the doctor's viewpoint is more than a drudgery—it should be a means of training in medical science, and an educational opportunity in every sense. From the institution angle it is more than a chance to count heads and enter a total number of visits per year to make the dry rot of an annual report. From the community standpoint it is bigger than an elegant edifice supported by voluntary contributions. From the health department's conception it is more than an address that can be given patients applying for advice and diagnosis. It must actually coöperate in health work by providing treatment and aiding control. For the patient, for whom it was built, it must be of greater service than a place to go and get some No. 5 (of which he takes one t. i. d.) with a suggestion that he can get some more next visit—if he cares to come around again. It should encourage, teach, uplift and control.

In Brooklyn we believe in sufficient facilities. This means adequate quarters, proper equipment, ample staff, good publicity.

We believe that it is a clinic function to bring the patient under treatment and retain him until cured. This demands printer's ink, bulletin boards and other propaganda.

We believe in intensive treatment and control and that it is *not* our function to preach morals if by so doing we interfere with our public health function.

We believe that the staff must get well acquainted with the individual patient for the community benefit.

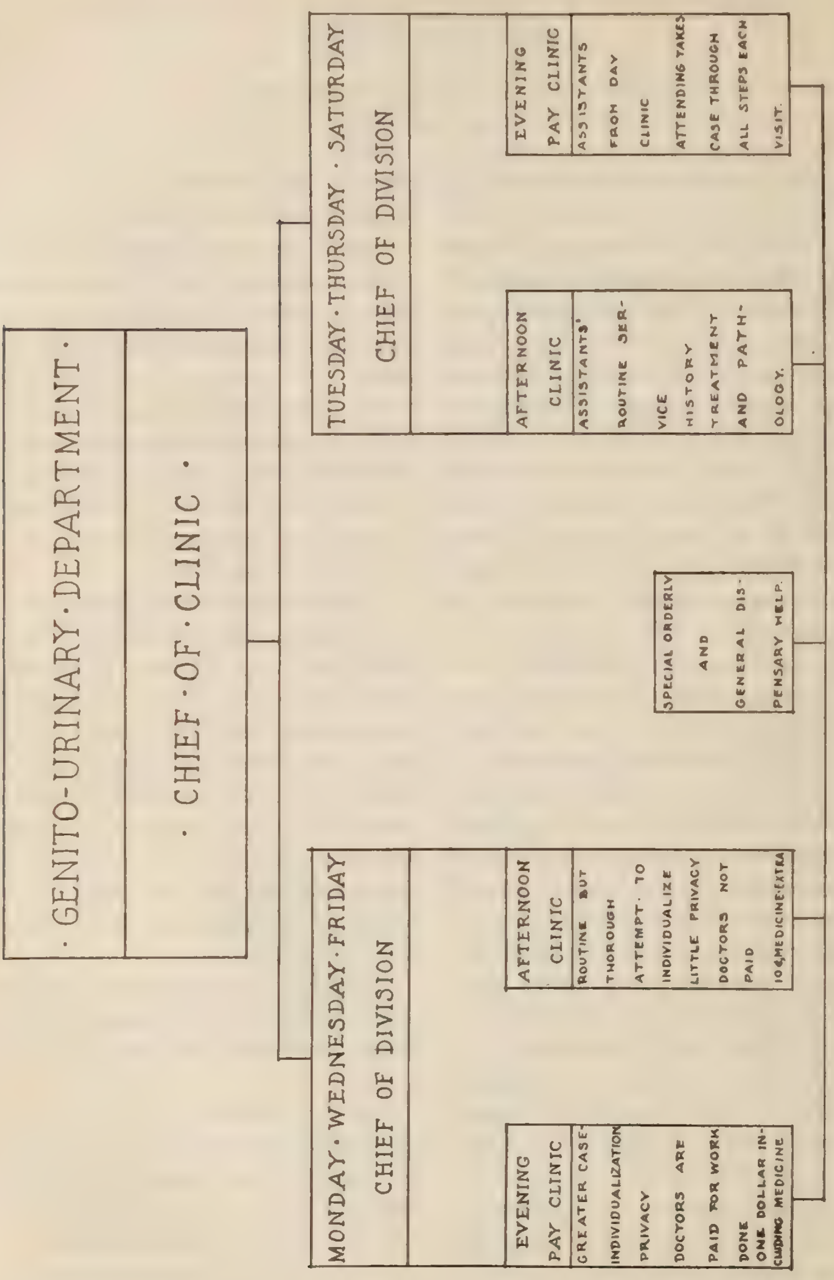
With this outline, permit me to demonstrate how we have tried to approximate these ideals.

The Genito-Urinary Department of the Brooklyn Hospital Dispensary was established by Doctor Rathbun in 1904, as sole worker. The gradual progression from the small beginning with one doctor attending two clinic days, to the present organization demanding fifteen doctors to properly care for patients at six afternoon, seven evening, and two morning clinic sessions, demonstrates the need for such a service.

Irregular attendance and lack of punctuality is an efficiency destroyer from which we have been remarkably free.

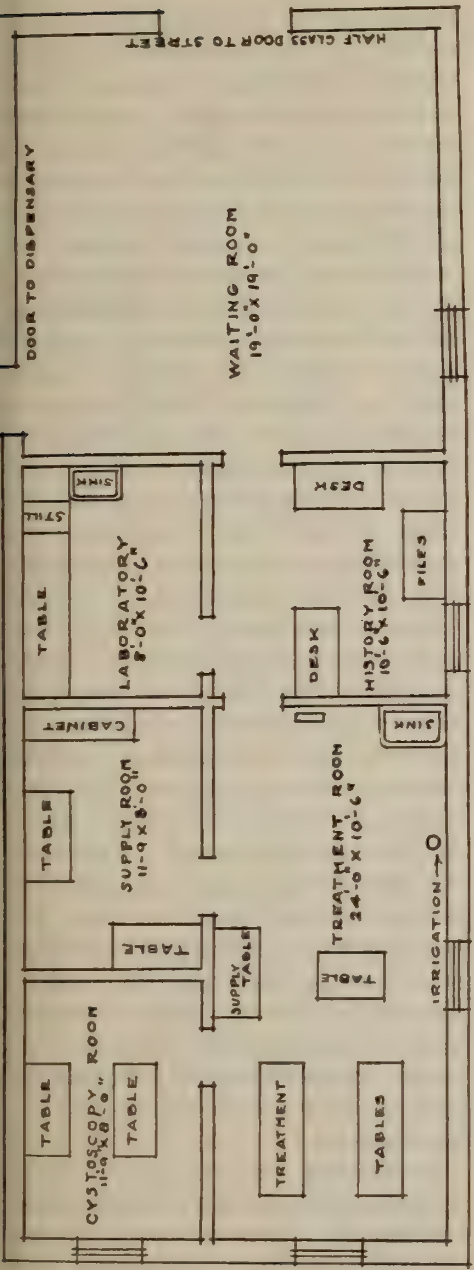
Our organization is very simple in its component parts and can be shown in graphic form, each division being the same in all details. Notes apply, therefore, to both divisions.

The chief of the department is the visible head of all work. To the patient he is consultant and to the staff he


· GENITO-URINARY · DEPARTMENT ·
· CHIEF · OF · CLINIC ·
MONDAY · WEDNESDAY · FRIDAY
CHIEF OF DIVISION
EVENING PAY CLINIC
GREATER CASE INDIVIDUALIZATION PRIVACY DOCTORS ARE PAID FOR WORK DONE ONE DOLLAR INCLUDING MEDICINE
AFTERNOON CLINIC
ROUTINE BUT THOROUGH ATTEMPT TO INDIVIDUALIZE LITTLE PRIVACY DOCTORS NOT PAID 10¢ MEDICINE EXTRA
SPECIAL ORDERLY AND GENERAL DISPENSARY HELP.
TUESDAY · THURSDAY · SATURDAY
CHIEF OF DIVISION
AFTERNOON CLINIC
ASSISTANTS' ROUTINE SERVICE HISTORY TREATMENT AND PATHOLOGY.
EVENING PAY CLINIC
ASSISTANTS FROM DAY CLINIC ATTENDING TAKES CASE THROUGH ALL STEPS EACH VISIT.

SCHEME OF ORGANIZATION OF THE BROOKLYN DISPENSARY is instructor and critic. The day and evening clinics are in charge of a division director, so that each unit is distinctly separate in all details,—staff, history file, contact with patient, etc. The afternoon service is free, except for fees of ten cents per visit, with medicine at cost. For the evening service a charge of one dollar per visit is made, covering both treatment and medicine. The two divisions of the staff attend on alternate days, the same doctors being present both afternoon and evening of any day. This arrangement has been made in order to correlate as far as possible the "free" and "pay" services. Patients whose circumstances lead to a change from one clinic to the other, remain under the care of the same physician.

The department is located at the extreme end of the dispensary building and is practically a separate unit, having its own street entrance. The floor plan, as arranged, is convenient.


HALF GLASS DOOR TO STREET
DOOR TO DISPENSARY
WAITING ROOM 19'-0" x 19'-0"
SINK
STILL
TABLE
LABORATORY 8'-0" x 10'-6"
DESK
HISTORY ROOM 10'-6" x 10'-6"
FILES
DESK
CABINET
SINK
SUPPLY ROOM 11'-9" x 8'-0"
TABLE
TREATMENT ROOM 24'-0" x 10'-6"
IRRIGATION
TABLE
SUPPLY TABLE
TABLE
CYSTOSCOPY ROOM 11'-9" x 8'-0"
TABLE
TABLE
TREATMENT
TABLES

FLOOR PLAN OF THE BROOKLYN DISPENSARY

The department having been established and built up to its present state by the chief, and he being at all times in active attendance in both divisions, a few simple rules have tended toward a distinct uniformity of method which in no way interferes with the individuality of the division work.

Since the establishment of the evening pay clinic each division has its own filing system. Case histories are kept on paper sheets 10 inches by 11½ inches. These are folded once and filed, in envelopes, by number. A white cross-index card is filed by name and contains the case number. When for any reason a case history is closed it is removed from the active drawer and transferred to the inactive file to await binding. As each one hundred histories are completed they are bound in a loose-leaf cover. In this manner all cases are readily found at any time. A further index, by disease, is made at the time of binding. All cases thus become available for either the day or evening clinic in the respective divisions. The files, being in the genito-urinary department history room, are accessible to both divisions in the event of any patient returning on the wrong day, or after the case history has been closed.

Through the topics under the headings "Referred By" and "Previous Treatment" much information of positive value in the extension of our working plans for the future has been obtained.

On the reverse side of the sheet nothing is printed. A rubber stamp for the continued record of the findings of the urological scheme is used as needed. When further sheets are needed, a simple continued history sheet is used. This contains one line for name, number and department division.

When the patient, in his turn, enters the history room, a complete history is taken at the first visit, or the history reviewed, if it be a subsequent visit. At each visit the patient's story is noted by the historian and the required examination and treatment ordered by the chief of the division. These orders are carried out in the treatment rooms and the results reported to and recorded by the historian who then gives any necessary prescription.

An institution working to protect the community must place the patient well in the foreground, although the object in organizing a venereal clinic is really twofold: First, the proper treatment of the patients, the prevention of reinfections and the spread of the disease to others; second, the scientific study of venereal diseases, the investigation and elaboration of methods of treatment, and the training of workers in this branch of medical science. The clinic effectively operating on this dual basis becomes a valuable factor in the education and protection of the public.

Our early experience and the increase in work done during the past three or four years showed us the need of other hours for treatment. A night clinic was established in 1908, on the dispensary basis, but it was not over-successful. We believe the reason to have been organization defects. It was not a pay clinic and there was no salary for the physicians. We had hoped to establish a pay clinic when the new building opened in 1912 but the time did not seem propitious for success. Having had four years for improvements in method, developing the attending staff, and the general organization, we can look for a steady forward movement in service to the public, to the welfare of the patient, and the efficiency of the doctors in venereal work.

In the first year our "pay" clinic showed a total of 2,671 visits, 109 the first month. The first month of our second year shows 424 total visits.

Protection of public health demands control of communicable disease. In order to maintain supervision over cases until they are no longer a menace to the community, something must be done to regain control when the patient ceases treatment before being discharged as cured. To do this in the usual manner of social service work is obviously difficult. Personal visitation in routine venereal work is not practical unless under the direction of unusually qualified and tactful persons. The use of a card mailed in a sealed envelope, requesting a return visit, is simple and efficient. The envelope has a return address but not the institution name, thus eliminating home comment. At least three cards are sent before removing the case history from the active list. The interval between cards depends largely upon the degree of menace in each case. The "follow-up" is maintained by means of a card system. Each visit, note, reason for termination of case, etc., is recorded.

The third card sent is stamped "Your Last Chance." Frequently this does the work. The value of this method was tested during a six months' trial period. One division sent cards while the other did not. The divisions were parallel during the same period in the previous year. The division sending cards had 469 more visits as a direct result of this "follow-up."

The result of this simple method has been a decided increase of control by revisits to the clinic, return to private physicians or other hospitals and the resuming of treatment in other cities. This information reaches us by mail, by telephone, by friends as well as by personal return of patients. In the cases reached, about 62 per cent. who cease treatment before discharge are being heard from. The other patients who receive the cards and do not answer must also derive some slight benefit. One hundred and forty-five letters have been received from patients in one year. Seven hundred and twenty-two new patients with 6,897 revisits.

Each new case admitted to the Department is presented with a copy of a ten-page pamphlet upon venereal diseases. The effort to drive home the message by accent type, short sentences, common language, and the general arrangement has over-shadowed any attempt at literary style.

In addition to the Brooklyn Hospital Dispensary pamphlet, the New York City Department of Health pamphlet on venereal diseases is distributed. During the course of a patient's treatment, the Department of Health card on gonorrhea or syphilis is given and is a useful therapeutic measure. The patient must be inoculated with the stick-to-it-until-you-are-well idea. To do this demands constant advice and encouragement.

The door from the waiting room into the history room has a sign upon it, one by two feet. Across the top of this sign the patient is greeted each visit with the information YOU MUST COME TO THE CLINIC REGULARLY FOR TREATMENT, then appear the days that he is expected to return for treatment and a final line which reads, DO NOT STOP TREATMENT UNTIL THE DOCTOR TELLS YOU THAT YOU ARE WELL.

A bulletin board two by four feet

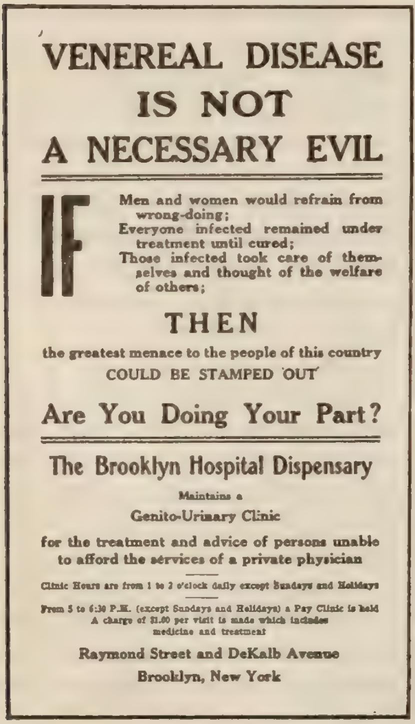
is hung in the waiting room. The basic matter upon it is always the same but it is variously presented. The arrangement is under three general headings: Prevention, Syphilis, Gonorrhea. The notices posted under these headings are in various shapes, colors, types, and wordings. They are changed weekly and they are usually in easily understood language and sometimes in common parlance.

Under the disease titles there are frequently posted the instruction sheets of other clinics and of various departments of health.

On either side of this board are frames for notices. One is permanent and the others are changed at intervals. The permanent notice reads:

> THIS CLINIC WANTS TO HELP MEN
> WE HAVE A PAMPHLET
> EVERY PATIENT COMING HERE IS ENTITLED TO A COPY.
> THE DOCTOR WILL BE GLAD TO GIVE YOU AN EXTRA COPY.
> HAVE YOU A FRIEND IN NEED OF HELP? SPEAK TO HIM.

The notices to be changed cover hygienic points such as care of the teeth, cleanliness, diet, etc. Four other boards in the room carry a good and bad exhibit. The "good" exhibit includes the Department of Health and the Brooklyn Hospital



VENEREAL DISEASE
IS NOT
A NECESSARY EVIL

IF
Men and women would refrain from wrong-doing;
Everyone infected remained under treatment until cured;
Those infected took care of themselves and thought of the welfare of others;

THEN
the greatest menace to the people of this country
COULD BE STAMPED OUT

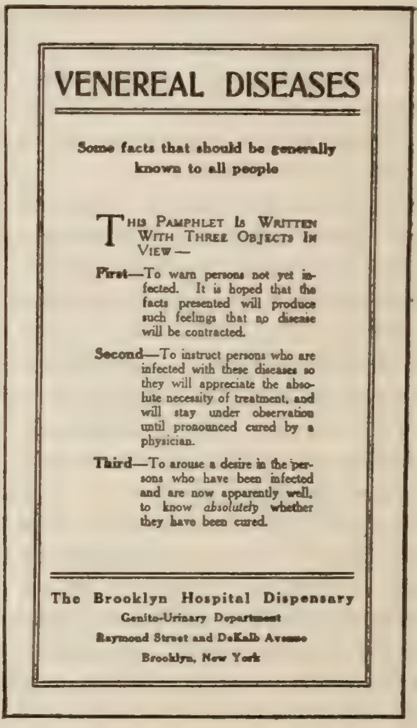
Are You Doing Your Part?

The Brooklyn Hospital Dispensary
Maintains a
Genito-Urinary Clinic
for the treatment and advice of persons unable to afford the services of a private physician

Clinic Hours are from 1 to 2 o'clock daily except Sundays and Holidays

From 5 to 6:30 P.M. (except Sundays and Holidays) a Pay Clinic is held
A charge of $1.00 per visit is made which includes
medicine and treatment

Raymond Street and DeKalb Avenue
Brooklyn, New York



VENEREAL DISEASES

Some facts that should be generally known to all people

THIS PAMPHLET IS WRITTEN WITH THREE OBJECTS IN VIEW—

First—To warn persons not yet infected. It is hoped that the facts presented will produce such feelings that no disease will be contracted.

Second—To instruct persons who are infected with these diseases so they will appreciate the absolute necessity of treatment, and will stay under observation until pronounced cured by a physician.

Third—To arouse a desire in the persons who have been infected and are now apparently well, to know *absolutely* whether they have been cured.

The Brooklyn Hospital Dispensary
Genito-Urinary Department
Raymond Street and DeKalb Avenue
Brooklyn, New York

Dispensary sign plates, pamphlets, instruction cards, etc. The "bad" boards show a most motley array of quack and patent medicine signs, the spoils of our "tear down the fake" and "put up the true" campaign.

Given the organization, equipment, and desire to serve the community through the patient, the road leading to the greatest degree of success is coöperation with other bodies striving in the same field but with different parts of the work.

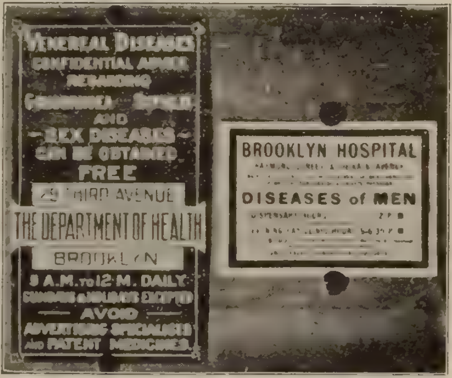
Invasion of the domain of quackery by the Department of Health had been successful. Meeting fire with fire had been found to work. With the coöperation of the Committee of Fourteen of New York City, the Brooklyn Hospital Dispensary offered to place the Board of Health plates in its territory.

After various conferences with the Department of Health, the Committee of Fourteen and the Liquor Dealers Association of Brooklyn, metal plates offering the facilities of the Department of Health for advice and diagnosis, and of the Brooklyn Hospital Dispensary for the treatment of diseases of men were made and placed in saloon toilets, factories, etc.

Our first sign was placed January 28. In all about 180 saloons have been visited and 175 of our signs placed. When our signs go up the quack signs come down! In 19 saloons no signs were found. In 98 saloons over 300 quack signs were removed. We have been refused permission in 27 saloons and of these but 8 had quack signs.

Coöperating with other organizations, we entered upon another publicity scheme this summer. Sex education, advisory and diagnostic service, and the combating of quackery were combined. Mr. Osborn, secretary of the New York Social Hygiene Society will enlarge this topic in the discussion.

Our records show a preponderance of new cases recorded as "Referred by Patients" and a few as "Otherwise."



We have been able to trace 200 new patients to the signs and the Coney Island Health Exhibit. It pays to advertise.

We know that this work has been of value. It is certain that good must follow, and an ever increasing number of men be brought and kept under treatment until no longer a menace to the community. This will not only apply to the Brooklyn Hospital Dispensary, but through awakening a desire for knowledge of certain cure in the patient, it will surely follow that many men will return to the private practitioner.

Permit me to reiterate a few points that have, I hope, been illustrated in describing our organization.

The protection of the community against the venereal peril is a great big coöperative problem. I say coöperative because unless the educational system, the health authorities, the workers along religious, social and moral lines combine with those of us who are in the treatment phase of the work, the maximum of good will not be obtained.

We must provide accurate information on sex hygiene to the uninfected. We must give advice and diagnostic service to the persons exposed or exposing themselves to infection. We must establish treatment facilities on a high standard of efficiency. All phases of the work must be given free, if needed, or at such a modest cost that they are easily available to all the community. A campaign that will educate the public, the medical profession and social welfare workers to the seriousness of the situation now confronting this country, must be instituted—a campaign that will parallel the work in tuberculosis, cancer, etc., but without any scare element or hysteria.

Publicity and education will deprive the quack of his biggest assets,—mystery and ignorance. The fake medical schemer has been hard pressed during the past few years and further plans for the complete abolishment of quackery must include treatment facilities of good repute, adequately advertised to the public.

Publicity and education should go hand in hand. Health departments in their advisory capacity tend to greater publicity—for nothing carries greater weight than governmental documents. Social hygiene societies, clubs, churches, associations of young men and women can and are doing excellent work in sex hygiene. More publicity and further education are needed before the effect upon the incidence of venereal disease will be measurable.

Granted that the quack is cornered and only needs to have the death blow administered; assuming that the laity is being taught social hygiene and greater publicity is required; appreciating that the facilities for diagnosis now at hand are being used and can be enlarged to meet future needs; *then* the problem facing us is the provision of high grade treatment facilities for the cases now being encountered. This is a very important division of the forces available in the coöperative warfare that must be waged against venereal disease.

Affiliation with other bodies such as the American Social Hygiene Association, the local and state society as well as with business organizations in the territory about the institution will be of great value to the clinic and to the community. The whole community, both public and private, should coöperate for the mutual advantage of the state, the patient and the not yet infected citizen.

Nothing can be judged without the passing of time. The question of pay clinics in the special branches of medicine and surgery is a vital topic that is in its infancy. Some adequate facility must be provided for each group of our population in need of special attention, including a place in the community for specialized treatment of the patient unable to afford the properly equipped private practitioner's charge, who is barred from patronizing the dispensary by reason of his work, his pride, or his financial ability to pay a modest fee.

In the sphere of venereal disease, every facility that can possibly be provided for early diagnosis and proper treatment is of paramount importance in protecting the individual, advancing knowledge, perfecting treatment, training workers, combating quackery, promoting social hygiene, and conserving the public health.

We hope to see the sum total of typhoid reduced, we wage unceasing war upon tuberculosis, we rejoice at the practical suppression of smallpox, we quarantine against the exanthemata and we must now enter on a broad-minded campaign for the elimination of Neisser and Treponema infection with its far greater social and economic loss in every walk of life and branch of government.

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VENEREAL DISEASES IN THE WAR ZONE.

In the war zone of France there has occurred an alarming increase of venereal diseases both amongst the soldiers and the civilian population. There can be no doubt that an increase in clandestine prostitution is the principal cause of this state of affairs; but it is also certain that this epidemic has been propagated among the classes which might have been hoped to remain unaffected, and that many married women, including the wives of men at the front, have been infected and will ultimately contribute to the spread of the disease. On account of the gravity of this venereal peril, the medical service of the army has reinforced the prophylactic measures, particularly by creating special organizations for the diagnosis and treatment of these diseases. These organizations are divided into (1) urology, (2) dermatology and syphilology centers. To these centers are to be sent as early as possible not only all patients with characteristic chancres, but also those presenting the slightest suspicious erosion or ulceration. It is expressly forbidden to keep under observation at the regimental hospital a man presenting a suspicious ulceration in order to clear up a doubtful diagnosis. There is one venereologic center for each region, composed of a hospital service, a consultation service, a dental service and a laboratory. The special function of the dental service is to prepare the teeth of syphilitics preparatory to intensive mercurial treatment. This intensive treatment by salvarsan and mercury is necessitated by the urgency of returning valid men to the army as soon as possible. Orders have been issued that periodic lectures on venereal diseases shall be given in all depôts and in the medical formations of the army, and that pamphlets on this subject written in a clear and concise style shall be distributed in order to propagate correct ideas on prophylaxis. Further, the military surgeons are called on to lend the utmost support and collaboration to the civil authorities to insure the best possible conditions for the working of the venereal service for civilians of both sexes. Daily consultations will be given, the hours of which will vary from day to day, thus making them accessible to all classes of patients. On the other hand the Ligue Française, being of the opinion that the present means of fighting the extension of venereal diseases are inefficacious, has proposed that these diseases be assimilated to other contagious diseases by the adoption of quarantine. Infected women would then remain isolated in special hospitals until cured.—*Medical Officer*, London.

MAINE'S NEW HEALTH LAW.

C. E. Turner, M. A.,

Instructor in Biology and Research Associate in the Department of Biology and Public Health of the Massachusetts Institute of Technology.

AT THE adjournment of the seventy-eighth legislature of the state of Maine on April 7 the newspapers commented at length upon its acts relating to war, suffrage and prohibition, but nothing was said about a matter no less important to a modern democracy: namely, public health. And yet this legislature and the progressive administration of Gov. Carl E. Milliken are to be credited with giving the state a form of health organization second to none in the country, one which is sure to place Maine among the leading states in preventing disease and safeguarding the health and welfare of its citizens.

The act creating a State Department of Health was introduced and supported by the State Medical Association, acting through its legislative committee. The influence of this organization is widely felt in Maine, and from such an association with its Committee as that enjoyed by the writer during the recent campaign for re-organization it is apparent that the continued and assured support of this wide-awake and progressive body of physicians will be of inestimable value to local public health progress. The support accorded to the measure by many leading educators, scientists and public men in the various parts of the state was also important. Their statements, together with strong letters from prominent summer residents, public health experts, and statesmen elsewhere, assisted materially in placing the case clearly before the legislative bodies, particularly the Public Health Committee of the legislature, before whom the bill had its hearing. This committee gave to both the main provisions and the details of the plan a careful and intelligent consideration. After being convinced of its worth, they worked with the proponents of the bill to secure its presentation in the most desirable form and reported unanimously in favor of its passage.

The establishment of a State Department of Health is a step in advance which clearly expresses the growing appreciation of public health activities in Maine and a desire that the state shall secure the most efficient method available for the prosecution of this work. The State Board of Health which the new organization is to supplant was created in 1885 and has an excellent record of efficient and faithful service. Its early and authoritative reports upon school hygiene, disinfection and the prevention of tuberculosis as well as such activities as the development of the permanganate process for liberating formaldehyde gas and special methods of public health education, have met with nation wide approval. Moreover it is significant that Maine, which was fourth from the last among the states in establishing a board of health, is now among the very first of the states to institute such a re-organization as authorities agree is best calculated to administer the increased public health duties of a state department.

The need of re-organization in Maine arose from a condition which is not today peculiar to that state. The Board of Health, which was created at the time when sanitary science was in its infancy, found itself overburdened by the increasing activities placed upon its shoulders through the recent advances of the science. Bills to allow the Board to embark upon new fields of endeavor have been almost constantly before the legislatures of recent years. Among these bills, for example, have been requests for district sanitary inspectors and for state inspection of hotels and summer camps. Such piecemeal legislation however was hard to secure, and the board remained with limited activities and appropriation.

It was evident that the State seriously needs improvements in local health administration. A few of the summer resort towns, of which York is a conspicuous example, are securing the services of a well trained, full time local health officer, and the experiment in York has been so successful from every point of view that after three years of trial the renewal of an appropriation of one dollar per capita for public health work was voted unanimously at the last annual meeting. But in most towns of the state there is need of a direct stimulus for health work.

Other needs are, more effective work in the control of contagious diseases, better provision for the distribution and use of sera and vaccines, the extension of educational work, and definite campaigns for the protection of child life and for the prevention of tuberculosis. There are many labor and pleasure camps in Maine, as well as the numerous hotels over which the state might well institute an effective supervision.

These improvements it was believed could be best assured by a comprehensive reorganization, and consequently a bill was proposed following in general the New York-Massachusetts plan, which provides for a State Department of Health consisting of a commissioner and a Public Health Council, together with directors of divisions, district health officers, and other employees.

In Maine the law provides that the Commissioner, a man experienced in public health administration, shall be appointed by the Governor for a term of six years. Upon him rests the responsibility of administering the laws and regulations relative to health and sanitation. He shall prepare rules and regulations for the consideration of the Public Health Council, appoint directors of divisions, district health officers and other employees, submit annually to the Public Health Council recommendations regarding health legislation, and perform all executive duties previously required of the State Board of Health. He has power to direct any executive officer or employee of the State Department of Health to assist in the study, suppression or prevention of disease in any part of the state.

The Public Health Council is to consist of the commissioner and four other members, two of whom shall be physicians, to be appointed by the Governor for a period of four years. It is to meet once a month and at such other times as its members may determine, and it will be the duty of the council to make and promulgate rules and regulations in furtherance of the public health law, to advise the commissioner upon the appointment of district health officers, and other employees, and to recommend to the legislature needed health legislation. It is to have no administrative or executive duties.

There are to be such divisions in the State Department of Health as the commissioner, with the approval of the Public Health Council may from time to time determine, and the commissioner with the advice of the council, is to appoint and may remove a director of each division.

The Commissioner from time to time is to divide the State into three or more health districts appointing to each district a district health officer who shall be a graduate of an incorporated medical school or shall have been certified in public health by a reputable institution of collegiate grade. These men are to spend their full time in the field work of the department.

The bill provides that the Commissioner of Health shall receive an annual salary of $4,000, that the Public Health Council shall receive $5 a day while in conference and their necessary travelling expenses, and that the compensation of directors of division and district health officers shall be fixed by the Commissioner of Health but shall not exceed $2,500 per year.

Public health workers may feel that the annual appropriation of $30,000 which this bill carries, is indeed a small sum upon which to begin the work of such a state department. If Maine should spend 2 per cent. of its total appropriation upon health work, a proportion which Surgeon Carroll Fox of the federal service suggests is a fair distribution of funds, the department would receive $142,000, while the Massachusetts expenditure of 1.2 per cent. would give the department $80,000. But it should be remembered that the original appropriation with which the State Board of Health began work in 1885 was only $3,000, that it has never exceeded $20,000 and that it is still the privilege of health administrators generally to do a large amount of work on a small amount of money. Moreover the last legislature passed an additional act providing for the making of Wasserman tests and giving the health Department an annual appropriation of $4,000 for this work.

Another act, which preceded the health bill in its enactment, placed the responsibility of preventing the pollution of public water supplies in the hands of the Public Utilities Commission, allowing them $4,000 a year for this work. So that, although it may be generally believed that this duty belongs to the State Department of Health, which has a laboratory already equipped for doing sanitary water analysis, the Department for the present at least is relieved of this financial responsibility.

The task of the new department is not an easy one but it is confidently hoped that this type of organization which has been instituted in New York and Massachusetts with highly satisfactory results, being continued from year to year with its original freedom from political system and with a general coöperation for increased efficiency, may yield to Maine all that it has given to these other States in decreasing the amount of preventable disease and promoting the health of its citizens. Its organization upon a non-political basis is assured, and the centralizing of authority, the appointment of district health officers to stimulate the usually well-meaning but often ineffective local boards of health, together with the opportunity for new and specially profitable fields of activity, are sure to give both the permanent residents and the summer guests of the State of Maine the best available health protection.

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BLINDNESS IN THE UNITED STATES.

The forthcoming report on the blind in the United States announced by Director Sam. L. Rogers, of the Bureau of the Census, Department of Commerce, indicates that 30.8 per cent., or somewhat less than one-third, of the blind population lost their sight when less than twenty years of age (including those born blind); 47.4 per cent., or somewhat less than one-half, during the early or middle years of adult life (from twenty to sixty-four years); and 21.8 per cent., or a little over one-fifth, in old age (after passing their sixty-fifth year). More persons were reported as having lost their sight when less than five years of age than in any other five-year period of life, 16.4 per cent., or about one-sixth, of the total being included in this group; persons reported as born blind formed 6.6 per cent. of the total and persons reported as losing sight when less than one year old 5 per cent., these two groups together contributing 11.6 per cent., or more than one-tenth, of those reporting the age when vision was lost.

These statistics are based on an enumeration of the blind made in connection with the census of 1910. The blind population enumerated was 57,272, and by sending out special schedules through the mails the bureau obtained data regarding such subjects as the cause of the blindness and the age when it occurred from 29,242 blind persons.

The fact that the 30,000 blind represented in the returns had on the average been blind for sixteen years makes plain the gravity of this misfortune. Although the risk of blindness in infancy, childhood, or youth is relatively small, yet, as shown by these figures, the complete elimination of that risk would reduce the blind population by nearly one-third.

Since 1880 there has been a distinct decrease in the proportion of blind who lost their sight in infancy. In 1880 persons who became blind before completing their first year of life formed 15.3 per cent. of the total reporting, as compared with only 11.6 per cent. in 1910. This decrease is explained largely by the great progress made toward preventing blindness among new-born infants through the use of the Credé method of prophylaxis for ophthalmia neonatorum, which was discovered in 1884.

The proportion of the blind who lost their sight during the early or middle years of adult life has increased somewhat since 1880.

This marked difference with regard to the period of life when loss of sight occurred is of course the result in the main of the cases of blindness from industrial accidents or occupational diseases, which are numerous among the male blind though relatively few among the females.

Book Reviews.

The Adolescent Period. *Louis Starr, M. D., L.L. D. P. Blakiston's Son & Co., Philadelphia. 1916. 210 pp. Price, $1.00 net.*

A surprising book in many ways is "The Adolescent Period" by Doctor Starr. It contains many practical suggestions, apparently gleaned from the author's own experience, for dealing with the problems of this period. Some of these are modern in spirit, and concrete in form, and generally calculated to be of use to either parents or teachers. In one sense, the appeal of the book is limited, for most of the suggestions are applicable only for the people who "motor" and send their boys to the expensive and English type of boarding school.

The first chapters deal with normal growth through adolescence, and the specific types of physical education which the author favors. The disorders of adolescence are next considered. There is a tendency here to imply that extremes are averages, which might make the parents over anxious. Such diseases as epilepsy, hysteria, dementia præcox, neurasthenia, and others are mentioned almost as symptoms of adolescence, and discussed with a detail, and yet necessarily with a lack of a background, hardly justifiable in so short a book.

The last three chapters deal with the faults and criminal tendencies of adolescence, menstruation, and sexual enlightenment. They too contain a surprising mixture of modern teaching and dogmatic, arbitrary, and conventional statements, apparently based on what the author holds to be "common knowledge" rather than on any scientific investigation. Where the boys are spoken of, there is considerable authority of tone but Doctor Starr's knowledge of girls is not convincingly first hand.

Such statements occur as "the theft habit is very difficult to eradicate, especially in females"; and "of purely mental processes her [a girl's] ideas of form—squares or triangles—are better than of objects—plants or animals; her memory is good from ten to fourteen, but poor before and after; . . . she is not so good an observer, is apt to be inaccurate in describing occurrences, and swayed by selfish interests, is more given to exaggeration and falsehood." These seem to call for some citing of authority.

The author does not underestimate the importance of menstruation in a woman's life. "All her acts, opinions, and even criminal tendencies must be estimated by their time association with it. . . . During her first period the girl must rest in bed until the hemorrhage is completely over. Subsequently, at least three days should be passed in bed, and two or four more idling about her room, dressed, but most of the time flat on a lounge. . . . With the bodily, there must be mental rest. . . and while mildly interesting reading, fancy work or other unfatiguing occupation may be followed, the mind must not be taxed by exciting novels or intricate hard work."

To a mind weary with controversy and theory, there will be a charm about the rather definite ages which the author gives for sex enlightment on various subjects, and the ages at which definite crimes most frequently occur.

The two points most emphasized in this book are the necessity for a very different mental and physical training for the adolescent boy and girl, and the danger of over study for all children.

Eunice B. Armstrong.

Poverty and Its Vicious Circles. *Jamieson B. Hurry, M. A., M. D. J. & A. Churchill, London. 1917. 180 pp. P. Blakiston's Son & Co., Philadelphia. Price, $2.00 net.*

Once again Dr. Hurry has given us a stimulating and constructive piece of work. Not only the author with something fresh to say deserves hearty appreciation; the man who says something in a fresh way also enriches us. It was the graphic freshness of vision, the wide view of a vast field that made Dr. Hurry's earlier book on "Vicious Circles in Disease" of such value. The many readers who benefited by the unusual form, as well as the clarity of the first work, will read eagerly this year's larger contribution.

The first book was valuable in that it suggested a helpful way to look at a great problem, or a great number of problems. This later study uses this method of seeing cause and effect in their characteristic circular form, as a means to discuss a wide range of problems. The book is full of most useful references to many authorities and shows the author's wide knowledge of many inter-related problems.

Its careful fairness of statement, and its unhampered thought are an unusual combination. Many writers would be content to take merely one of these circles and write a book about it. Its wealth of suggestion is what will make this book almost a necessary index to thought along these lines.

The table of contents alone is interesting reading: "Circles Associated with Defective Housing; with Excessive Fecundity; with Unequal Taxation; with Employment of Women and Children; Poverty a Self Perpetuating, Self Aggravating, a Fatal Disorder; the Breaking of Vicious Circles by Legislation, Voluntary Organizations, and Individual Effort. These are but a few of the chapter headings in this valuable work.

Donald B. Armstrong, M. D.

The United States Pharmacopœia. *9th rev. edition. The Surgeon General, U. S. P. H. Service, Washington, D. C. 1916. 80 pp.+728 octavo.*

The book, in appearance, resembles the previous edition of the Pharmacopœia, now out of date, though everything in the book has been revised. The introductory pages give a table of contents, historical introduction, with review of the proceedings of the ninth decennial convention in 1910, also a preface in which is outlined the changes in the book. Several tables together with a review of the International Protocol compared with the drugs and preparations of the U. S. P. IX are given; also lists of admissions, deletions and changes in the official titles, both in Latin and English, followed by tables of comparison showing the strength of the more important preparations in the preceding and present editions of the Pharmacopœia.

The main part of the book comprises 497 pages and contains monographs for 782 articles, including 9 general headings, 188 drugs, 265 chemicals and 320 preparations, as against 958 articles in the U. S. P. VIII. In this edition a net decrease of 176 articles was made, while there were 29 changes in official Latin titles and 28 in official English.

The other part of the book includes a table of atomic weights based on oxygen as 16, a table of the elements and pharmacopœial chemicals, and their value in molecular weights, a table of multiples, also a list of reagents, test solutions, volumetric solutions and directions for testing. The table of alcoholic contents in preparations is given and followed by directions for determining the alcohol, for making alkaloidal assays and for determining certain physical and chemical constants, together with notes for sterilizing and percolating. An extensive list of diagnostic reagents and clinical tests is given, together with alcoholometric tables, tables for temperature corrections and thermometric equivalents. The usual acid, alkali, weight and volume relations tables are given, also tables for converting metric quantities into apothecaries' weight and measures. Among other things mentioned the change in connection with opium appears important, in that it complies with the international treaty of 1906 placing it on a 10–10.5 per cent. basis of anhydrous morphine in place of from 12–12.5 per cent. of the crystallized as mentioned in U. S. P. VIII. Again, a very important change is the statement regarding the maximum and minimum strength of preparations. The usual index is found thus completing the book.

J. Gaub.

The National Formulary. *4th edition. The Surgeon General, U. S. P. H. Service, Washington, D. C. 1916. 40 pp.+394 octavo.*

This book is distinct from the preceding editions, in appearance. The introductory portion of the book includes a short history, and a preface in which the changes are summarized. This portion of the book contains a list of preparations added and dropped from the formulary; also a list of changes in the official Latin titles together with some special notes of importance and a complete discussion of sterilization.

The main part of the book has three parts.

The first part has 255 pages and contains 596 titles, together with 12 general formulæ and 584 galenical preparations. The net gain in additions and deletions was 18 over the third edition. Ninety fluid extracts are included of which 50 are new and 30 were taken over from the U. S. P. VIII. The elixirs constitute the second largest group of preparations, numbering 79. Next is found 54 titles of solutions followed by 50 tinctures. Among the new preparations found are fluidglycerates, sprays, and ready made petroxolins; the steatins or slave mulls of N. F. III are given as mulls.

The second portion is devoted to descriptions of standards for drugs used in their preparations, but not included in the U. S. Pharmacopœia; it is new. This part covers 98 pages, describing 186 drugs, 140 of vegetable origin, 6 of animal origin and 40 chemicals. This part of the Formulary was prepared by the Committee on Standards of the Pharmacopœia under the direction of Mr. George M. Beringer as chairman.

In the third part a novel feature is found, in that many special tests reprinted from the Pharmacopœia by special permission appear. Then there is the index which completes the book.

Both the National Formulary and the Pharmacopœia fix a minimum and maximum requirement for purity which come close to theoretical perfection. It is hoped that these improved standards are practically applicable, and that it will be possible to attain the new requirements and that the methods of assay will help to insure physicians and their patients the uniformity of strength and composition in the drugs and preparations that will be used.

J. Gaub.

Health Department Reports and Notes.

REPORTS.

New Bedford, Massachusetts.

The 1916 Annual Report of the Department of Health of this large New England mill city of 118,000 population reports a lowering of the death-rate per 1,000 population to 15.31—the lowest on record. Of the 1,810 deaths, 485 were of children one year of age or under, giving an infant mortality-rate of 131.85 per 1,000 births, as compared with a rate of 134.55 for 1915.

The health authorities, however, realize the problem of the reduction of this rate to be a most important problem, and not only have instituted excellent remedial measures, but too have been forced to meet the situation of a declining birth-rate. In 1909 the birth-rate per 1,000 inhabitants was 43.3, while in 1916 it was 31.1. A classification of infant deaths has shown that prenatal influence and improper feeding are the two main factors in this city's infant death-rate, and work along these lines has been inaugurated. It is hoped by the addition to the nursing staff to follow the baby through its first year of life. From the fact that over half of the infant deaths were among the Portuguese, it is shown that much improvement can take place through the social organizations of these people—and such a coöperation is hoped for.

From an excellent discussion of tuberculosis it is evident that this disease is causing a severe strain on the department's appropriation. In this connection it is seen that of a total expenditure of $50,337 for communicable diseases, $44,651 goes for the care and treatment of the tuberculous. The main problem seems to be concerned with the care of the advanced cases, which the state refuses to admit to its sanatoria, thus thrusting a great responsibility on the municipal department—a responsibility which, the report indicates, should be borne by the state, at least partially. Notwithstanding this, the department has been most active and efficient in its efforts to stem the tide of this disease. A reduction of reported cases is noted, though an increase in deaths is reported. From a classification of occupations it is seen that the cotton mill operatives exceed to a great degree all other classes in contracting tuberculosis, though this class has shown a reduction for the year reported.

Both in 1915 and 1916 an interesting and marked falling off of cases of scarlet fever and diphtheria has been reported, particularly among school children. This is due directly, it is believed, to the intensive education of the parents relative to these two diseases. Morbidity-rates for the other common infectious diseases remained comparatively normal, though an increase due to poliomyelitis is noted. However, only one death resulted from this cause. There were reported 65 cases of typhoid fever, resulting in 5 deaths, giving the low rate per 100,000 population of 4.2. In this connection, New Bedford attained third place among cities of her class, as reported by the American Medical Association in their Fifth Annual Survey of Typhoid Fever in the Large Cities in the United States for 1916. In 1915 this city had a typhoid fever death-rate per 100,000 of 18.2.

Terminal fumigation has been supplanted by thorough mechanical cleansing with no ill effects, though with a considerable saving in time and money. The problem of garbage collection and disposal had again to be met with by this city, resulting in the collection being done by the city highway department, and the disposal of the garbage let out by contract. The old system failed, due to increased cost in operation.

The report itself is well prepared, observing a nice sequence. A table of contents adds to its usefulness.

The Island of Porto Rico.

From the report of the Director of Sanitation of Porto Rico, more particularly from the report of the Division of Transmissible Diseases and Bacteriological Laboratory, under the direction of Dr. José Brioso, it is seen that the short-sighted policy of the federal government in reducing its appropriation for insular health work is reaping its most natural harvest,—an increase in disease incidence and mortality. In 1913–1914 a mortality of 18.6 per 1,000 was reported for the whole island; in 1914–1915, a rate of 19.7 was reported; and in 1915–1916 a rate of 21.9. An epidemic of smallpox and dengue occurred on the island during the year but of not sufficient proportions to materially affect the general mortality-rate. The reasons, as explained by the report are, first, the reduced appropriations; second, the increased prevalence and increased mortality from malaria and tuberculosis, due directly to the fact that no appropriation had been made for a proper campaign against either of these diseases; and, third, to the lack of proper nourishment "which is reported to have existed in certain sections of the Island and which has shown itself by a disproportionate increase in deaths in the very young and the very old." Furthermore the births reported for the year are 1,357 less than for the previous year, and the number of deaths of children under 1 year of age has increased by 307, and between the ages of 1 and 2 by 414.

For fifteen years smallpox has been practically unknown on this island, yet for this reported year the occurrence of an epidemic of smallpox must be recorded—529 cases throughout the Island. Its occurrence was directly due to the failure to vaccinate, and this failure was due to, first, lack of funds, second, to lack of sufficient personnel, and third to lack of interest on the part of the public. The disease was epidemic in May, but within three months was completely eradicated, conclusively proving the effectiveness of the means used to combat it. The creation and maintenance of a vaccine station is urged, since for effective vaccination it would be necessary to vaccinate 250,000 persons yearly on the Island.

There were reported 443 cases of malaria which next to tuberculosis is the prevailing disease on the island. Typhoid fever is constantly decreasing and it is a good sign to notice that the people are beginning to realize the necessity for sanitary care. In this connection, in 1911–1912, the first year of the organization of this service, there were 950 cases of typhoid reported with 131 deaths, and in this year there were only 145 cases with 94 deaths; 14,662 persons were treated for uncinariasis, of whom 37.4 per cent. were cured. The reduction in appropriation again reaps its results, for such a reduction in conjunction with the increased cost of drugs has necessitated the reduction in the number of dispensaries in the interior and has practically compelled the abandonment of the treating of this disease in towns.

Tuberculosis increased during the twelve months reported by 307 deaths, thus causing 2,274 deaths. While funds have been appropriated for the present year to combat malaria, not one cent has been appropriated to combat tuberculosis, and thus it is expected that this disease will still increase in its ravages.

The bacteriological laboratory has accomplished results far in excess of expectations, limited as they are by lack of facilities and funds. Medical inspection of schools has been inaugurated, though up to the time included in this report no more than 500 examinations had been made, yet the results of these demonstrate the importance of such examination.

From the conclusions it appears that the difficulties of the work of this department are seriously increased by the failure of the courts to impose punishments in any way adequate or proportionate to the gravity of the offense committed. And such decisions and inadequate sentences imposed must not only encourage the violators of the law but, too, discourage the officers of the service.

As with the previous year's report this report represents a combat between effective health work and ignorance, indifference and prejudice. Within the last two years, to these already severe enough existing conditions, there has been added the almost unsurmountable condition of lack of funds, due to a constant diminution of the appropriation. Where the first three conditions can be slowly but surely eliminated by education and instruction, the last condition can only be eliminated by fair legislation, a problem which we could so easily and should so readily solve.

Medical Department of the United Fruit Company.

The Annual Report of the Medical Department of the United Fruit Company for the fiscal year ended September 30, 1916, reports extensive additions and improvements in the hospital facilities of the several divisions of the department. The prevailing disease of all three divisions, that is, the Banes, Nipe, and Tela Divisions was malaria, though the sanitary measures in force during the reported year materially decreased the number of cases. The treatment has been standardized in all divisions in line with previous experience. Amœbic dysentery is still reported from Costa Rica and Santa Marta, but it is expected that the system of water filtration under construction in these districts will soon mitigate the existing conditions. In this connection it has been found by clinical experience that emetine alone does not cure this disease, but that following its use, large doses of bismuth subnitrate, properly administered, brings about permanent results. Many cases of chronic leg ulcers come to the hospitals, and these materially increase the number of hospital days and are most tedious, so that hereafter measures have been adopted to prevent the employment of men already afflicted in this manner. Uncinariasis, or ankylostomiasis, is present in considerable amount, and oil of Chenopodium has been found to be the most effective vermifuge. In the Nipe division, of 3,452 stools examined, about 13 per cent. showed signs of the hook worm infection.

This medical department has over sixty thousand persons dependent upon it for treatment, not including the passengers, officers, crews and ship laborers on its steamships. An interesting commentary upon the effectiveness of the department's work is the fact that of these thousands of dependents, there were over eighty-two thousand patients treated at the company's hospitals and dispensaries, and of this number there resulted a death-rate, per 1,000 persons dependent, of 7.54.

The report itself contains many valuable tables of particular significance to those interested in tropical medicine, and sets forth extensively the scheme of the organization of the department and its general instructions.

NOTES.

Community Health of Cities in Middle and Western Pennsylvania.—During the weeks of March 12 and March 19, 1917, the Metropolitan Life Insurance Company with the coöperation of the health and philanthropic agencies in the cities of middle and western Pennsylvania conducted a health census among its policy-holders and among the general population of those cities. The inquiry was made through the company's agency staff. The health status of a little more than 328,000 persons was ascertained, among whom were found 5,789 cases of sickness. In some of the cities the survey reached over 20 per cent. of the total population.

It is especially important to know that this representative portion of the population in the cities surveyed included a large number of men, women and children of the wage-earning classes. The findings of the census may be conservatively held to represent health conditions among the population, and especially the working classes, of the mining and iron and steel regions in Pennsylvania.

For all the cities combined, the sickness-rate was 18 per 1,000. The following table shows the principal facts of sickness among the occupational groups represented in the survey:

TABLE I.

SICK PERSONS PER 1,000 EXPOSED—PRINCIPAL GROUPS OF POPULATION SURVEYED IN LEADING CITIES OF MIDDLE AND WESTERN PENNSYLVANIA.

Group of population surveyed.	*No. of persons enumerated.*	*Rate of sickness per 1,000.*
All groups in state	328,051	18
Bituminous coal mining employees	5,428	23
Other persons in bituminous coal mining families	17,439	15
Anthracite coal mining employees	16,230	26
Other persons in anthracite coal mining families	43,721	16
Other persons in state	245,233	17

The number of cases of sickness per 1,000 persons was greatest among anthracite coal mining employees; the next highest sickness-rate was found among bituminous coal mining employees. Members of anthracite coal mining families, other than the miners themselves, showed a rate of 16 per 1,000, which was slightly higher than the sickness-rate among members of bituminous coal mining families, other than the miners themselves. Among other persons in the state, not employed in mining occupations or who were not members of mining families, the sickness-rate was 17 per 1,000. A further development of these sickness statistics according to the precise diseases and conditions observed in the several occupation groups will be published in the final report of the health census of western and middle Pennsylvania.

The sickness-rate was higher among colored than among white persons. In the group of cities as a whole, 21 colored persons were sick for each 1,000 enumerated; the corresponding rate for white persons was 17 per 1,000.

The districts of Pittsburgh, Braddock and Pottsville showed the lowest sickness rates for the survey, 16 per 1,000 canvassed. The New Kensington and Hazleton districts showed a sickness-rate of 17 per 1,000. Wilkes-Barre district had a rate of 18 per 1,000; Johnstown and Shenandoah, 19 per 1,000; Connellsville, 20 per 1,000; McKeesport, Altoona, Scranton and Shamokin, a rate of 21 per 1,000. The highest rate for any section in the state was shown for Uniontown, and the immediate vicinity where the rate was 23 per 1,000. These facts are developed in the following table:

TABLE II.

SICK PERSONS PER 1,000 EXPOSED—PRINCIPAL DISTRICTS OF WESTERN AND MIDDLE PENNSYLVANIA, MARCH 12 TO 24, 1917.

Area.	*Rate per 1,000 exposed.* *Total.*	*White.*	*Colored.*
Districts* surveyed in (Pennsylvania, total)	18	17	21
Pittsburgh	16	16	18
Braddock	16	16	23
McKeesport	21	20	24
Pottsville	16	16	†
Uniontown	23	22	28
Connellsville	20	19	23
Johnstown	19	18	39
Altoona	21	22	†
Scranton	21	21	†
Shamokin	21	21	†
Wilkes-Barre	18	18	†
New Kensington	17	16	†
Hazleton	17	17	†
Shenandoah	19	19	†

* These districts include the towns and villages immediately adjoining the city specified.

† Insufficient data.

Taking the group of cities in Pennsylvania as a whole, the chief causes of disability registered in the survey were accident and injuries, which accounted for 11 per cent. of the total; rheumatism was next in importance with 8 per cent. of the total and influenza with 7 per cent. of the total cases of sickness registered. Pneumonia was registered in 6 per cent. and tuberculosis in 3 per cent. of the cases. Diseases of the stomach, asthma, diseases of the heart, "colds" and bronchitis each accounted also for about 3 per cent. of the cases of sickness.

On the basis of the sickness-rate shown about seven days per inhabitant of working age are lost each year on account of sickness.

◆

Health Campaign among Negroes.—In order to combat the unnecessarily high death-rate among negroes, the New York City Department of Health, in coöperation with the National League on Urban Conditions among Negroes conducted an intensive educational campaign in that city during the last two weeks in April. According to the *Weekly Bulletin* of the department for April 7, figures prepared by the director of the Bureau of Records show that the general death-rate among the colored population is almost double that of New York City at large. Thus, in 1916, out of 77,710 deaths, 2,628 were among the colored population. Inasmuch as the colored population is estimated to be slightly over 107,000 this gives a negro death-rate of 24.4 per 1,000 negroes as compared to the general city death-rate of 13.7 per 1,000 during the same year. It is also well established that the colored babies born in that city have only half the chance of living through the first year that the white babies enjoy. Last year out of every 1,000 white babies born 91 died in the first year; out of every 1,000 negro babies born, 194 died in the first year.

These results are further substantiated by the results published by the U. S. Census Bureau from returns throughout the country, as evidenced by the fact that,

For each white person out of every 1,000 dying of	*There die of each 1,000 colored persons*
All diseases	1.7
Diseases of the heart	1.5
Bright's disease	1.8
Pneumonia	2.0
Typhoid fever	2.2
Tuberculosis	3.2

*

State Board of Health Establishes Special Bureau to Direct Rural Health Work.—The Texas State Board of Health has established a new department—a Bureau of Rural Sanitation, whose activities will be devoted entirely to directing, supervising and assisting in conducting the rural health work made possible by the legislature's recent appropriation of $70,000 which is to be supplemented by a like sum from the Rockefeller Foundation through the International Health Board. Dr. P. W. Covington, professor of preventive medicine in the Medical Department of the University of Texas, a physician of long experience in rural health work, has been mutually selected by the agencies concerned as head of this department.

In a recent letter from the State Health Department to the commissioners of counties it was stated that, upon invitation, Doctor Covington would be glad to appear before the county board and personally explain how they may share in the state's appropriation.

The State and the International Health Boards propose to spend from three to six thousand dollars in conducting intensive health work in the rural districts of any county agreeing to employ four local assistants at the rate of $50 per month, each, for a period of not less than four months. These lay assistants to work with a staff of trained sanitarians who will, in the event the proposition is accepted by the county commissioners, conduct the work.

*

Wassermann Frauds.—The *New York Medical Journal* for April 7, 1917, contains the following article under this title;

"The Health Department of the City of New York states that a number of unscrupulous physicians in the city, apparently for the most discreditable reasons, have deliberately altered the free Wassermann reports furnished them by the department's laboratory and have exhibited such false reports to their patients, although it was expressly agreed that such reports would be given only to physicians and under no circumstances to the patients. In one case the physician changed a plus minus report to read four plus. In another case four plus was changed to read plus minus, and similar changes were made in reports furnished in still other cases. The department announces that it will take drastic action in the next case of this sort which comes to its attention. No condemnation can be too severe for the physician who would resort to such practices. It would seem incredible that such things could be done, but we have the assurance of the department that the proof is in its hands. The department will have the unanimous support of the physicians of the community in taking the most drastic action against any physician guilty of such contemptible practices."

*

Post-Graduate Medical Work Postponed.—On account of the unsettled questions of war, particularly as they affect the medical profession, the North Carolina State Board of Health makes the announcement that the Post-Graduate Medical Instruction Work, which the board and the State University had again planned for the physicians of the state this summer, will be suspended at least for the present time. This has been found advisable in order that physicians might be ready for active service in case of war and for the reason that the doctors who were to be the instructors of the classes have already pledged their services to their country as members of the Officers' Medical Reserve Corps.

The work of post-graduate medical instruction which was inaugurated a year ago by this State Board of Health and the State University, and which was at that time a new idea in health work, has proved to be a popular and valuable contribution to medical education. Dr. W. S. Rankin, who originated the idea and worked out the plan, has been called to explain this method before the New York State Medical Society, and other states and institutions have favorably considered the plan, the principles of which promise to become widely adopted.

To bring the instructor to the classes rather than the old way of bringing the classes to the instructor at about one sixth of the usual cost was the principle of the new method of medical education. Last summer two courses with two instructors, each having six classes were arranged for and as much or more were the plans for this summer but for the war.

⁂

Examinations for Sanitary Supervisors.—The Civil Service Commission of the state of New York announces an open competitive examination for the position of sanitary supervisor under the New York State Department of Health, in order to fill, by July 1, the four vacancies now existing on the list of supervisors. The examination will be held June 9, 1917. Salary, $3,000. Candidates must be physicians, and, when appointed, not less than twenty-eight nor more than fifty years of age. Additional requirements are that candidates must have served as health officer of a city, town or village having a population of at least 5,000 persons for a period of at least four years; shall have received instruction approved by the Public Health Council, with at least two years of experience in public health work, and shall otherwise satisfy the demands of the council. The examination is open to non-residents. All inquiries should be made of the State Civil Service Commission, Albany, New York.

⁂

Nuisance Abatement by Court Order.—The Division of Housing and Sanitation of the Philadelphia Department of Health and Charities was recently successful in obtaining an opinion from the Court of Common Pleas of that City, in relation to a bill in equity filed against the Bureau of Health and the appeal of the trustees of the estate of a certain Stephen Smith from an order to abate sanitary violations by the removal of weeds from the Olive Cemetery, Philadelphia.

The rule of the Bureau of Health is that "Weeds, noxious and poisonous plants, docks, tall grass and other offensive vegetable growths, shall not be permitted to attain a height of more than one foot on grounds surrounding dwellings, two-family dwellings, rooming houses, tenement houses or unimproved or unoccupied lands in any portion of the city of Philadelphia laid out in city blocks: provided, that this regulation shall not apply to lands under cultivation with growing crops."

The Division of Housing and Sanitation ordered the abatement of unsanitary conditions by removal of weeds and refuse. The trustees of the cemetery refused to comply with the order on the ground that it was unconstitutional. The court held that "the order of the Bureau of Health was not an arbitrary or oppressive misuse of its discretion in determining the nuisance existed, but from evidence presented in appeal it was justified, and the nuisance should be abated."

The Philadelphia Bureau of Health feels that this decision is most important, not only for the reason that the Health Department is upheld, but that it believes that civic improvement is directly dependent upon civic health, and that the question of vacant land in cities of large population is one that is probably giving considerable bother to many health authorities.

⁂

Tuberculosis Returns in Arizona.—The report of the Arizona State Board of Health for the six months from July 1 to December 31, 1916, gives the number of deaths from tuberculosis of all forms as 377, which with the number of deaths reported from this disease for the first six months of the year, namely 484, makes a total for 1916 of 861 deaths, out of 4,149 cases reported. These deaths represent more than 20 per cent. of the total deaths of the state reported for the year, and the Arizona State Board of Health feels that these deaths are of people who have come to the state in a highly diseased condition. Moreover, it will be noticed that the first half of the year registered considerably more deaths than were registered in the last half of the year, and this condition has existed for several years, as shown by the available figures: 1913, first half, 461; second half, 288; 1914, first half, 511; second half, 354; 1915, first half, 490; second half, 325; 1916, first half, 484; second half, 377. Commenting editorially on this subject, the April *Bulletin of the Arizona State Board of Health* assumes that "this probably results from the fact that people afflicted with tuberculosis are forced to Arizona by the inclement weather of their home states as winter advances. Very many stay at home until there is no hope of recovery. Then they come to Arizona and the helpless cases die in the early months of the year."

✣

The Cow Won.—An official of the Board of Health in a town not far from Boston notified a citizen of the town that his license to keep a cow on his premises had expired. In reply to this letter, the official received the following communication:

"Monsieur Bord of Helt—I jus get your notis that my licens to keep my cow has expire. I wish to inform you, M'sieur Bord of Helt, that my cow she beat you to it,—she expire t'ree week ago. Much oblige. Yours with respeck.

"PETE ———."

Public Health Notes.

Controlling Preventable Diseases in Rural Districts.—Dr. A. Caswell Ellis, writing in the *Texas Medical Journal* for April, 1917, describes a method of intensive rural health work employed in several East Texas counties last year. Particular stress was laid upon malaria, typhoid, hookworm and dysentery; largely because of their wide prevalence in those rural districts; but also because their causes are known and means of prevention well established; and the same measures that protect against one of these diseases protect also against some of the others.

Detailed directions as to how the communities were selected, the necessary funds raised, and how the campaign was carried out, are recorded in this interesting article.

A laboratory was established and the central schoolhouse was used all through the campaign as the place for lectures and other meetings. Every home was visited for the following reasons:

1. To secure the health history of each member of the family for the preceding year;
2. To inspect the premises and offer suggestions for remedying all unsanitary conditions;
3. To disseminate simply written and well-illustrated circulars and bulletins for the purpose of reinforcing and enlarging what the visitor had said;
4. To secure blood smears from each member of the family and to leave containers for samples of feces of each individual;
5. When desired, an appointment was made for a carpenter who was sent to assist in getting screens and privies properly made.

After the laboratory examinations were made, a report was sent to the head of the family and directions for treatment were communicated where necessary.

Doctor Ellis enumerates the following results of the coöperative work:

1. The lasting value of the hookworm work done by the Rockefeller Commission several years ago was made plain;
2. It was shown that even in a short time hookworm infection could be reduced from 25 per cent. to 3 per cent. by voluntary effort, and that almost an entire community could be induced to build sanitary privies without any process of law;
3. That 75 per cent. of the families in these districts that had properly screened homes entirely escaped malaria;
4. It was shown that it was more difficult to induce proper screening than it was to persuade building sanitary privies;
5. The value of the proper use of quinine in treating malaria was demonstrated;
6. The harmlessness of quinine as a prophylactic was clearly proven;
7. The most nearly accurate account yet secured of the actual kinds and amounts of preventable diseases present in the lowland, coastal plain country was obtained.

The article is concluded with a plea for greater efforts and expenditures toward eradicating these diseases.

◆

Newer Aspects of Infection in Pneumonia.—Edward Steinfield summarizes recent important findings concerning pneumonia in the *New York Medical Journal* for April 14, 1917.

Four types of virulent pneumococci have been isolated. Types I and II each produce a specific anti-serum, while for III and IV no anti-sera have as yet been obtained.

Diagnosis of type is valuable, first, because this shows whether an anti-serum will prove useful and indicates the proper type of serum, and second, because it helps in forming a prognosis. The worst cases of pneumonia are due to types II and III.

Transmission from person to person is believed to be by way of the respiratory tract, especially in the acts of coughing and sneezing. Experiments with rabbits show that exposure to cold is an important predisposing factor.

Infection is essentially a bacteremia and not merely lung involvement. Endotoxins are liberated when the coccus is broken up and digested by phagocytic cells. Agglutenins against types I, II and IV are formed in the blood, but are very transient. Likewise, the acquired active immunity is probably short,—possibly not more than a few weeks.

Recovered patients are known to have carried the virulent organism ninety days, and the author urges detention of recovered patients by public health authorities until the carrier state terminates in a manner similar to typhoid or diphtheria control.

◆

Public Health Training.—G. F. Vincent, Minneapolis (*Journal American Medical Association*, April 7, 1917), says that social demand and academic supply is far from an exact formula. Sometimes courses are offered in universities for careers that depend on other things than institutional preparation; on the other hand, they are often slow to recognize actual vocational needs. Both these tendencies are shown in the effort being made to meet the needs of public health service. It seems clear, Vincent says, that successful public health training must be carried on either by universities or schools in close affiliation with them. Only a well endowed institution can provide for all the training required by a public sanitarium, moreover, the university atmosphere of investigation is favorable and stimulating. The closest coöperation with agencies carrying actual health activities is also of fundamental importance. Excepting the apprenticeship opportunities in public health bureaus, the conscious attempts to provide the necessary training have been made so far by the universities and much has been accomplished. Vincent lists the institutions that have taken this up, including under them the one to be organized at Johns Hopkins University, with the aid of the Rockefeller Foundation. The preliminary requirements and the extent of the courses given are also stated, the usual degree obtained being that of doctors of public health. The variations in the courses of the various institutions are pointed out and the article may be considered as a fair statement, up to date, of the condition of public health instruction in this country. It is worth noting, he says, that in all practical field work is provided for. A few phases of public health work seem to have been overlooked or only incidentally recognized. For example, the application of public health publicity is one deserving of careful study and for which special types of training should be provided. A few individuals have shown conspicuously how much can be accomplished by wise methods of education and publicity. Vincent also enumerates the various types of public health officers that are required: men specially skilled for public health administration; laboratory men; administrative specialists; sanitary engineers; school medical officers who are more than practitioners and see the health of the school in its relations to community life, on the one hand, and individual efficiency, on the other; specialists in public health education and publicity; public health nurses for city and country; sanitary inspectors of many kinds; and probably other types yet to be added to the list. The sanitary engineer is a specialist in his particular line and not fitted for the responsible head of a municipal or state public health organization, as is sometimes supposed. The condition for admission to a public health course will require careful consideration. There is an advantage in requiring a degree in medicine from a first class college but there is danger that a physician will give too much time to unnecessary medical and surgical details. It is altogether likely, Vincent says, that requirements should be modified for the student, after his first two years of a medical course, to substitute a considerable amount of public health work for the clinical courses of the regular medical curriculum of the following two years, but it is undesirable for the man seeking the highest position in preventive medicine to have less than the equivalent to a four year medical course with two years of graduate work. For the several groups of public health workers, different requirements will probably be prescribed and it is conceivable that the curriculums may vary in length from two or four to eight years beyond graduation from high school. These matters will probably be worked out satisfactorily in time. The social sciences will receive more emphasis. The history of public health work, the problems of poverty and dealing with dependent and delinquent groups will be given closer attention. He mentions, also, the possibility of affording the students support by work as subordinates in public health work and by the establishment of fellowships. The outlook for public health in the United States, he thinks, is encouraging. It seems clear that not every medical school can provide a full course of public health training and Vincent thinks it desirable that a few centers be recognized and given support for the higher types of training. "The standards and ideals should be set by a few institutions which have the resources which will enable them to establish genuine schools, well equipped, properly manned, dominated by authoritative leaders, inspired by the public health point of view, and working in close fruitful relations with the public health agencies of the community, the state and the nation."

◆

Humor in Death Certificates.—Those who accuse the Englishman of lacking a funny-bone must except the editor of the *Medical Officer*, from whose columns we take the following:

"The following curious causes of death are stated by the North Carolina Board of Health to have been certified at various times to registrars in that state: 'Went to bed feeling well, but woke up dead.' 'Died suddenly at the age of 103. To this time he bid fair to reach a ripe old age.' 'Do not know cause of death, but patient fully recovered from last illness.' 'Deceased had never been fatally sick.' A mother 'died in infancy.' 'Died suddenly, nothing serious.' 'Pulmonary hemorrhage—sudden death. (Duration four years.)' 'Kick by horse shod on left kidney.' 'Don't no. Died without the aid of a physician.' 'Deceased died from blood-poison, caused by a broken ankle, which is remarkable, as his automobile struck him between the lamp and the radiator.' 'Blow on head with ax. *Contributory cause*—Another man's wife.'"

◆

Tuberculosis, a Disease of Children.—This is the title of an interesting article by Dr. F. Clifton Moor, appearing in the *Southern Medical Journal* for April, 1917.

Doctor Moor says that the points to be stressed are ample protection for all children under five, and prevention of the massive infection, which is sure to occur when there is active disease in either parent or some other member of the household. No mother with active disease should nurse her infant, and she and others of the household should be taught in detail by precept and example all the precautions necessary.

In a certain percentage of the families, where ignorance and poverty or a bed-ridden mother make home conditions hopeless, there is nothing to be considered except the removal of the younger children to a "preventorium," the establishment of which is one of the first problems that confronts us.

Another less important requirement in preventing infection is the control of bovine tuberculosis. This can be done only by uniform state laws or, better still, by the Federal Government. Work along this line has recently been instituted in Doctor Moor's own state, South Carolina. Beginning in 1914 with two nurses for the whole state, the number has been increased to thirteen, twelve of whom are assigned to definite districts. Previous to the establishment of this plan there were practically no cases reported to the board of health. During the first year of the present campaign 1,225 patients were seen by the visiting nurses, and up to September, 1916, 2,781 patients were or had been visited and instructed in the principles of prevention. The average time between visits is four weeks, and the nurses report that the great majority of families visited are interested and really endeavor to follow instructions.

✠

Pedal Hygiene.—The *Boston Medical and Surgical Journal* of April 12, 1917, contains an editorial entitled, "The Modern Tendency Toward Weak-Foot."

Present day civilization, it is stated, has brought in its train a condition of foot-atrophy from disuse. The increasing tendency to weak-foot is rendered obvious through the greater and greater demands for orthopedic aids to walking. Usually, however, these orthopedic aids in the incipient stages of weak-foot may do a great deal of harm. They still further rob the muscles of their rightful function of support. The indiscriminate use of artificial supports, usually arched quite beyond the normal and purposed for a sort of pseudo-overcorrection, is to be discouraged whenever possible.

Proper foot exercises to strengthen the offending muscles are most important for the relief of weakness in either arch.

Bad walking habits and bad fitting shoes constitute very great factors in the development of weak-foot. The normal foot is in a straight line from great toe to heel and maintained perpendicular to the midline of the body. Shoes must be built on the lines of the normal foot.

In conclusion the author writes:

"Only a timely and vigorous campaign of education in the matter of proper footwear, foot habits, and foot exercises such as marches, hikes and systematic foot calisthenics, can save us from becoming creatures who are neither four-footed nor yet twofooted, and certainly not sure footed."

✠

The Widal Reaction as a Diagnostic Aid.—The *Medical Officer* for March 10, 1917, prints the following:

"The Royal Health Department of the Kingdom of Saxony has issued the following dicta regarding the diagnostic value of the Widal reaction and the determination of the typhoid bacillus in the blood and feces: 1. The Widal reaction is not specific in the detection of typhoid. It is merely an aid and should be considered only in connection with the clinical history and the nature and degree of the reaction. 2. It may be regarded as positive only in the second week of the disease. 3. A negative Widal should not influence the diagnosis when typhoid is suspected. In such cases the test should be repeated. 4. A positive reaction with a serum dilution of 1.80 is of great value, but it must be remembered that the patient may have had typhoid before, and that in rare instances other diseases, especially jaundice, may give a positive Widal. 5. In the case of individuals who have received a prophylactic typhoid vaccination, the reaction may be positive for from three to five months afterwards. 6. A positive diagnosis of typhoid may be made on finding the typhoid bacillus in the blood of persons who have not received a prophylactic injection during the first week of the disease, and later in the blood of vaccinated persons. Material for such examinations is furnished by the authorities. 7. Typhoid bacilli will be found in the feces usually only in cases in which intestinal ulcers have formed, that is, not earlier than the end of the second week of the disease. It is to be noted that typhoid bacilli have been found in the stools of typhoid carriers."

✠

The Classification of Pulmonary Tuberculosis.—The classification of pulmonary tuberculosis from before the time of Bayle up to the present day concluding with the classification of the National Association for the Study and Prevention of Tuberculosis, now in general use in this country, and the rearrangement as worked out at Otisville in 1910 and adopted by the Sanatorium Association in 1916 are discussed by Walter L. Rathbun in the first number of the *American Review of Tuberculosis.* The National Association Classification recognizes four groups of cases: "Incipient," "Moderately Advanced," "Far Advanced," and "Acute Miliary Tuberculosis." The rearrangement adopted by the Sanatorium Association uses the above grouping to describe the anatomic lesions in a given case and adds a further qualifying classification of symptoms into "A, slight or none," "B, moderate," and "C, severe," any one of which may describe a case that falls anatomically into any of the four main groups.

These combinations are interpreted as follows:

LESIONS.	SYMPTOMS.
Incipient. Slight infiltration limited to the apex of one or both lungs, or a small part of one lobe. No tuberculous complications.	A. (Slight or None.) Slight or no constitutional symptoms, including particularly gastric or intestinal disturbance, or rapid loss of weight; slight or no elevation of temperature or acceleration of pulse at any time during the twenty-four hours. Expectoration usually small in amount or absent. Tubercle bacilli may be present or absent.
Moderately Advanced. Marked infiltration, more extensive than under incipient, with little or no evidence of cavity formation. No serious tuberculous complications.	B. (Moderate.) No marked impairment of function, either local or constitutional.
Far Advanced. Extensive localized infiltration or consolidation in one or more lobes. Or disseminated areas of cavity formation. Or serious tuberculous complications.	C. (Severe.) Marked impairment of function, local and constitutional.
Acute Generalized Miliary Tuberculosis.	

This scheme offers the following combinations:

Incipient A. Moderately Advanced A.
" B. " " B.
" C. " " C.
Far Advanced A.
" " B.
" " C.

The rearrangement unquestionably greatly increases the flexibility of the classification without appreciably modifying the original text.

◆

Typhus Fever.—P. K. Olitsky, B. S. Denzer and C. E. Husk, New York (*Journal American Medical Association*, April 21, 1917), after reviewing the work that has been done in regard to the body lice infection of typhus, give an account of their own experimental work in producing typhus fever in guinea-pigs by the intraperitoneal injection of infected lice, and studying it bacteriologically. They ground up lice, feeding on typhus fever patients, in a sterile mortar with about 4 cc. of saline solution, making a homogeneous suspension which was injected into guinea-pigs. After bleeding the animals, their defibrinated blood was injected into other guinea-pigs. The unsettled political conditions, however, interrupted the work so that the transmission of the virus could not be followed up completely to its termination. The necropsy on the original guinea-pig, however, showed the typical lesions of typhus fever and emulsions made from the spleen of the animal and cultivated anærobically gave, on culture, typical colonies of the typhus bacillus. The guinea-pig injected similarly with a like emulsion from lice taken from a subject of Brill's disease in New York showed no such reactions. In this case, they consider the evidence conclusive, however, that typhus fever can be transmitted to guinea-pigs by injection of typhus-infected lice and the typhus bacillus has been recovered from the spleen of the reacting animal. They emphasize the point that contamination of such cultures did not occur as might have been expected. When the intestinal contents of typhus-infected lice virulent from guinea-pigs were cultivated, pure cultures from the typhus bacillus often resulted. They notice the claims of da Rocha-Lima as to the specific distinctness of the bacillus obtained by him from typhus patients, and as evidence of this, his offering the variability of the gram-stained reaction in the organism described by him. They find that both gram-positive and gram-negative organisms have been often met with in the original colonies, as shown in their own experience and from those of Plotz and Baehr, and the constancy of a positive or negative-gram stain is not important. One factor should be noted, however, the relationship between the decolorization by Gram's method and the virulence of the organism. In conclusion, they say: "Since 1910, many observers in different parts of the world have reported the finding of an organism in typhus-infected lice. This organism they believe to have a casual relationship to typhus fever. Owing to the fact that improper methods have been used, culture of this organism was impossible. In Mexico, we have been able to grow this bacterium and to show that morphologically, culturally and serologically it is identical with the *Bacillus typhi-exanthematici*."

Industrial Hygiene and Sanitation.

Asphyxiation from Blast-Furnace Gas is the title of Technical Paper 106, Bureau of Mines, Department of the Interior, written by Frederick H. Willcox.

This report is issued by the Bureau of Mines in pursuance of its endeavors to increase safety and efficiency in metallurgical industries. It discusses the nature and causes of poisoning from blast-furnace gas, itemizes the places where gas may be expected to be encountered, suggests safeguards and points out the precautions to be taken in working about gaseous places.

Blast-furnace gas is peculiar in that it is very poisonous and under certain conditions, as when it has been cleaned, is without color or odor by which it may be detected. Gas is practically always present about the top and bottom of the furnaces, frequently in such small proportion that it is not evident to the physical senses, but at the same time in sufficient volume to cause asphyxiation if breathed for twenty or thirty minutes. Proportions sufficient to cause asphyxiation or gassing also occur with more or less frequency all along the route of the gas, at the stoves and boilers when they are taken off for cleaning or repairs, inside of gas mains, down comers, and other parts of the gas-main system, at sand or goggle valves, and during repairs to the charging equipment and stock line. The increasing application of furnace gas to gas-driven blowers and generators has introduced additional equipment such as tower washers, fans, and other cleaning devices that also must be entered from time to time for cleaning and repairs. At all the above places there is always the possibility that gas may be present where the crews have to work, either from leakage, insufficient ventilation, or from emission of gas retained in the brickwork, flue dust, or deposits in the apparatus. Though poisoning by blast-furnace gas usually results in nothing more serious than illness and severe headache, it may cause unconsciousness and even death, and realization of the dangers and a strict observance of every precaution is essential in undertaking any work in an atmosphere contaminated by furnace gas, or in sending men into confined places, from which it would be difficult to escape, in proximity to material emitting gas or difficult to ventilate.

◆

Dearth of Anti-Anthrax Legislation in United States.—During the closing months of 1915 and the early part of 1916 there was a sudden and startling increase in anthrax morbidity and mortality in the United States, particularly in New York, Massachusetts, and Pennsylvania. The relative importance of anthrax is shown by the fact that for every five deaths from lead poisoning reported in the United States Registration Area there is one death from anthrax. In Europe both private and public forces have combined to carry on an energetic campaign against industrial anthrax. The Anthrax Investigation Board of Bradford and District, in England, the German and French employers' mutual trade associations, and the famous labor clinic at Milan, Italy, have all made valuable studies of the disease and assisted in establishing preventive measures. The governments of the leading countries long ago drafted and secured the careful enforcement of sanitary rules for the dangerous industries, and researches in efficient and practical methods of disinfection are still under way. In the field of prevention, especially, the United States lags behind. Anti-anthrax serum is scarce and not readily available. No specific regulations for safeguarding workmen from the disease have yet been enacted by any state. Two states authorize workmen's compensation for all anthrax contracted in the course of employment. The entire subject is exhaustively and admirably treated by Dr. John B. Andrews in *Bulletin 205* of the United States Bureau of Labor Statistics.

◆

Boiler Explosions are from five to seven times more numerous in the United States than in England and from twenty to thirty-five times more numerous than in Germany, according to a recent statement by Dr. F. S. Crum, assistant statistician for the Prudential Life Insurance Company. That the consequent loss of life can be materially decreased by a competent inspection service is shown, he states, by the fact that the number of explosions of locomotive boilers was decreased 54 per cent. with a saving of life of 87 per cent. as the result of inspection required for locomotives engaged in interstate commerce. From *Safety Engineering* for March.

⁂

The Committee of the National Association of Manufacturers, hitherto known as the Committee on Workmen's Compensation and Accident Prevention, is now called the Committee on Health and Safety. The change has been made for the reason that the word "accident" automatically limited the scope of effort to accident prevention solely. It is recognized that occupational disease prevention and fire prevention are as essential as is accident prevention.

⁂

One of the Reasons of the Slow Progress of health insurance legislation in this country is that the subject requires deep study to be intelligently discussed. This being the case, it is not surprising that many people have a fixed opinion not at all based on the actual facts. Those who want to be fully informed of the present state of the intricate problem of health insurance here and abroad can do no better than read Dr. F. L. Hoffman's excellent address entitled "Facts and Fallacies of Compulsory Health Insurance." The address was presented before the Section on Social and Economic Science of the American Association for the Advancement of Science, December 28, 1916.

⁂

Breathing Apparatus Tests.—A pamphlet has been published by the U. S. Bureau of Mines (*Technical Paper 82*) which contains authoritative information regarding the relative merits of different types of breathing apparatus and the defects of all types now in use. The authors of the publication are Yandell, Henderson, and James W. Paul. The report has for its purpose to show the inherent limitations of present types of oxygen breathing apparatus, to indicate improvements in design, to explain how by relatively slight changes of adjustment the present types may be made more efficient, and to present the results of practical tests. The authors have coöperated from the points of view of the physiologist and the engineer. The results of the tests with the present types of apparatus in the smoke room, in the open air, and in mine rescue work and maneuvers demonstrate the necessity of training in accordance with a definite schedule of work. Until improved types of apparatus are made in which the temperature of the impure air is under better control, the carbon dioxide of the breath absorbed with greater efficiency, and a visible amount of oxygen automatically supplied, present types of oxygen rescue apparatus must be used, in spite of their limitations. The Bureau of Mines has attempted to develop an apparatus along the physiological lines for which it calls. Mr. Gibbs of the Bureau has produced an apparatus which, in experimental tests, has shown itself superior to the older types, but which has still to be subjected to further tests in service. Its principal features have been patented for the Bureau of Mines, and, if finally successful, will be made available for general use.

⁂

Approximately Four Times as many people are employed in the factories of New York state as are employed in building and construction work. Yet during the four years from October 1, 1910, to September 30, 1914, according to *Special Bulletin No. 80*, State of New York, Department of Labor, more fatalities due to accidents occurred in building and construction work than in factories. The numbers were: building and construction work, 1,641; and factories, 1,285. Fall of person caused more fatalities than any other single cause. Undoubtedly many accidents are traceable to ignorance, carelessness or indifference of the workmen rather than to defects in materials or construction.

⁂

The Report of the Social Insurance Commission of California to the legislature of 1917 is a sweeping endorsement of practically the whole program of social insurance—health, unemployment, old age, invalidity—as "a practical and effective means of counteracting at least some of the harmful results of modern industrial conditions upon the well-being of the wage earners." Compulsory health insurance is urged as the most logical first step in such a program. The April issue of the *Monthly Review of the United States Bureau of Labor Statistics* contains a synopsis of the report.

A Threefold Plan of Social Insurance, embracing service pensions, compensations for accidents and health insurance, has been put into operation by F. C. Huyck & Sons, woolen manufacturers, Albany, N. Y., for the benefit of its employees numbering approximately 400. The employees contribute 1 per cent. of their wages to the fund. Details of the plan are available in the April issue of the *Monthly Review of the United States Bureau of Labor Statistics.* The company appears to be well satisfied with the operation of the plan and feels that the expense has been amply justified by the results achieved.

*

Coal Mine Control in England.—According to an announcement in the British *Board of Trade Labour Gazette* for February, 1917, the government has decided that the board of trade shall take possession of all the coal mines in the United Kingdom for the period of the war, in addition to those in South Wales which have already been taken over under the Defense of the Realm Act. The president of the board of trade has decided to set up a new department, which will control the coal mines and will also exercise the other powers and duties of the board of trade with regard to coal.

*

General Requirements for Sanitary Installations have been prepared by the Sanitary Committee of the United States Steel Corporation. The information published by the Sanitation Committee is to be used as a guide in standardizing sanitary equipment in order to ensure the provision of efficient sanitary facilities and proper sanitary conditions at the time construction work is planned. All legal requirements, such as local building codes, city ordinances, plumbing regulations, etc., must of course be observed. Details of the regulations appear in the March *Safety Engineering.*

*

A Decision Recently Arrived at by the Industrial Board of Indiana may have the effect of reducing the number of eye accidents in the industries due to carelessness or negligence on the part of the worker. The defendent company provided proper goggles and instructions to the effect that these must be worn. The plaintiff disregarded instructions and was subsequently injured around the eyes. The Industrial Accident Board ruled that the plaintiff was not entitled to an award.

*

The Greater Part of the Splendid Educational Exhibit of the Aetna Life, Accident and Liability Companies in the Palace of Mines at the Panama Pacific Exposition during 1915, has now been set up at the American Museum of Safety in New York City. A brief description of the exhibit contained in *Safety* for March.

*

The Nashville, Chattanooga and St. Louis Railroad is fitting out a "Safety First" car. It is planned to run the car over the road, making stops at all points to deliver illustrated talks on the safety work and its objects, and in this manner secure the active coöperation of the public generally.

*

The Fourth National Exposition of Safety and Sanitation will be held at the Grand Central Palace, New York City, during the week of September 10, 1917.

*

Up to January 1st the California Railway Commission inspected about 2,000 grade crossings. About 8,000 remain to be inspected. The cost to the commission has been approximately $2.40 for each crossing.

*

The Administration of Child Labor Laws in New York State is very exhaustively treated in a publication of the U. S. Department of Labor, Children's Bureau (*Industrial Series, No. 2, Part 2*). The authors are Helen L. Sumner and Ethel E. Hanks.

Communications.

To the Editor:

In as much as the very valuable report of the Commission on Milk Standards of the N. Y. Milk Committee, published in the U. S. Public Health Reports for February 16, will be generally accepted by those interested in the milk question as an accurate summary of the development of the grading system, it seems unfortunate that in enumerating the cities where the plan has been taken up no mention is made of Chicago.

This omission is all the more singular because it happens that Chicago legislation on grading milk anticipated by more than four years the position recently reached by the Commission.

Summarizing briefly, the findings of the commission are that there should be three grades of milk:

(A) Produced, transported and sold under conditions which justify its sale unpasteurized. The cows from which it comes to be annually both tuberculin tested and physically examined.

(B) Milk from cows shown to be free from disease by an annual physical examination and produced, transported and handled under such conditions that the count will not go over 1,000,000. All milk of this grade to be pasteurized.

(C) Milk of such inferior grade that "Recognition of this grade of milk is not recommended by this commission except in communities in which such recognition is an economic necessity."

In other words that permitting sale of C grade milk at all should not be a matter of choice but of necessity.

The Commission furthermore finds that:

1. Bacterial standards have to be adjusted to local conditions and should if possible be progressive.

2. That the records of the recording thermometers on pasteurizers should be examined not less than once a month, but suggested no plan for avoiding fraud.

3. That the permit or license to producer of dealer should be for a specific grade of milk, to be stated on label.

4. That in dating labels uniform methods should be adopted.

5. That the efficiency of pasteurization be controlled by bacterial tests before and after treating.

6. That in making the bacterial count the standard methods of the American Public Health Association, Laboratory Section, should be employed.

Taking up the above mentioned matters *seriatim*, it appears that in Chicago milk was divided into the following grades:

(A) The first—obtained from tested animals, and permitted to be sold without pasteurization, and with a count of not over 150,000 in winter and 200,000 in summer.

(B) The second—obtained from cows physically examined and with a bacterial count, before pasteurization, of not over 750,000 in winter and 1,000,000 in summer.

(C) That no inferior grade was recognized.

And it further appears—

1. That bacterial standards were adjusted to local conditions and were in effect made progressive by the provisions raising the standard of farm scoring, lowering the temperature required and raising the standard of pasteurization at certain future dates.

2. That pasteurizers had to have recording thermometers under the control of the Health Department.

3. That the permit or license was for a specific grade and it was required to be plainly stated on the label or cap.

4. That uniform methods were prescribed for dating labels of all grades.

5. That provision was made for standardizing the operation of each pasteurizer on the basis of bacterial efficiency as shown by count before and after process.

6. That the methods prescribed in making tests were those recommended by the American Public Health Association.

The ordinance containing the above provisions was passed August 14, 1912,—so long ago that the commission probably forgot it when preparing in 1916 to make its latest recommendations.

The matter of course is only of interest to those concerned with the accuracy of sanitary history and to the authors of the Chicago ordinance, Assistant Health Commissioner Godfried Koehler, and the writer.

Very truly yours,

G. B. Young,

Late Commissioner of Health of Chicago.

Personal Notes.

Friends of public health advancement will regret to hear of the resignation of Dr. Ernest C. Levy as chief health officer of the city of Richmond, Va. Doctor Levy has worked for many years in an earnest endeavor to improve the health conditions of the city and has been instrumental in bringing about the many improvements accomplished. Space does not permit us to enumerate the results and achievements accomplished by the Richmond Health Department under his directorship. Suffice it to say that the annual reports of Doctor Levy were eagerly watched for by health workers and in a sense constituted a text-book for advanced public health practice and thought. Last year Doctor Levy explained that he would resign from his health officership unless the city granted the increased appropriation for health work recommended by him, being unwilling to continue in a position where he was unable to get a little nearer giving Richmond the kind of a health department she was entitled to, besides enabling him to satisfy his own sense of what the city should have. In spite of this, the increase in the appropriation was not granted, owing very largely to the great opposition on the part of the newspapers on the plea of economy. In this way Richmond loses the services of one of the foremost health officers in the country, and only too clearly brings before us the necessity of the creation of the public conscience, so that instead of a slight monetary gain it will be possible to make predominant confidence in health work and realization as to its necessity. Doctor Levy has joined the staff of the North Public Health Bureau of New York City. He is to be succeeded by Dr. Roy K. Flannagan.

✥

Dr. William A. Evans, president of the American Public Health Association, has been appointed chairman of the sub-committee on sanitation of the Committee of National Defense.

✥

The Women's Medical Association of New York City is planning a banquet to be held at the Hotel McAlpin on Wednesday evening, June 6, 1917, for the women physicians who will be in New York for the meetings of the American Medical Association. Tickets, $3, may be obtained from Dr. Matilda K. Wallin, 616 Madison Avenue, New York City.

✥

The University of Pennsylvania announces that two fellowships, the Thomas A. Scott and George B. Wood fellowships, will be vacant in the Laboratory of Hygiene of this University for the session 1917–1918. These fellowships are designed to train and develop investigators and teachers in the field of public hygiene. All inquiries should be addressed to Dr. A. C. Abbott, director, Laboratory of Hygiene, University of Pennsylvania, Philadelphia.

✥

It is reported that in view of the growing scarcity of salvarsan brought about by war conditions, the holders of the American patents on these products are permitting Dr. J. F. Schamberg of the Dermatological Research Laboratories of Philadelphia to supply arsenobenzol.

✥

The trustees of the Atlanta University have, through Edward T. Ware, offered to place the university buildings and grounds, in case of need, at the disposal of the United States Government, hoping that they can in some way be used to prevent or relieve the hardships attendant upon warfare, especially as they may effect the negro people.

✥

Mr. Curtis E. Lakeman, executive secretary of the American Society for the Control of Cancer, and Dr. William F. Snow, general secretary of the American Social Hygiene Association, are temporarily detailed to administrative work in the medical section of the Council of National Defense at Washington, D. C.

✥

Mr. J. W. Magruder, secretary of the Baltimore Federated Charities, has been appointed an associate of Ernest P. Bicknell, director of civilian relief of the American Red Cross, with headquarters at Washington, D. C.

Charlotte Rumbold has been appointed to the staff of the Cleveland Chamber of Commerce as an assistant secretary working with the committees on city planning, housing, sanitation and public recreation.

◆

Mr. George H. Craze, formerly with the National Housing Association, has been appointed assistant to the chief of the Bureau of Housing of the Pennsylvania State Department of Health.

◆

Dr. Linsly R. Williams, now deputy commissioner of the New York State Department of Health, has been appointed first deputy to the New York City Department of Health.

◆

Dr. Richard M. Olin has been elected to succeed Dr. John L. Burkart, resigned, as secretary of the Michigan State Board of Health.

◆

Dr. Arthur K. Bennett has been appointed to succeed Dr. R. C. Main, resigned, as health officer of Marquette, Mich.

◆

Dr. James W. Inches, formerly mayor of St. Clair, Mich., has been appointed health officer of Detroit, Mich., until July 1, to fill out the term of former health officer, Dr. William H. Price, resigned.

◆

Governor Lowden of Illinois has announced the appointment of five members of his cabinet provided under the Consolidation Bill, among whom Dr. C. St. Clair has been appointed director of the Department of Public Health.

◆

Dr. Jacob C. Geiger, recently chief bacteriologist of the California State Hygienic Laboratory, and assistant director of the Bureau of Communicable Diseases of the State Department of Health, has resigned from that position to enter the United States Public Health Service.

◆

Dr. Mitchell O. DeVaney has been appointed health commissioner of the city of Indianapolis, succeeding Dr. Jay D. Nusbaum.

◆

The following persons were elected to membership in the American Public Health Association, April 20, 1917:

John L. Faulkner, Lynchburg, Va., Bacteriologist and Assistant Health Officer.

H. W. Nowell, M. D., Boston, Mass., Pathologist and Bacteriologist, Massachusetts Homeopathic Hospital 1911–14.

J. M. Moseley, M. D., Arcadia, La., Member State Board of Health.

T. T. Tarlton, M. D., Grand Coteau, La., Member of State Board of Health.

J. T. Abshire, M. D., Le Roy, La., Member State Board of Health.

Thomas A. Roy, M. D., Mansura, La., Member State Board of Health.

L. C. Chamberlain, M. D., New Orleans, La., Member of State Board of Health.

Ruth O. Pierson, Wellesley Hills, Mass., Bacteriologist.

A. D. Hiller, Boston, Mass., Assistant Editor, American Journal of Public Health.

Arch M. Mandel, Detroit, Mich., Assistant Director, Detroit Bureau of Governmental Research.

T. B. Beatty, M. D., Salt Lake City, Utah, State Health Commissioner.

W. Thurber Fales, Boston, Mass., Student at M. I. T.

Current Public Health Literature.

AMERICAN.

American Food Journal, Chicago.

XII. April.

The Food Situation of the Country. D. F. Houston.
The Food Manufacturer and the Law. Lannen and Hickey.
What Is Diseased Meat? C. W. Stiles.
The Manufacturer of Bread. By the Editor.
Fermentation in the Production of Bread. George L. Teller.
Laboratory Control in Bread Making. H. V. Cadwell.
Care of Confectionery. W. C. Hughes.

American Journal of Diseases of Children, Chicago.

13. April.

Epidemiology of Bacillary Dysentery. W. G. Smiley.
Review of Recent Literature on Conditions of Abnormal Metabolism in Infants. J. L. Gamble.

Boston Medical and Surgical Journal.

CLXXVI. April 5.

History of Medicine and Its Contributions to Science. Major Chamberland.

April 12.

On Disease Incidence in China. C. A. Hedblom.
The Cause of Poliomyelitis. Horace Greeley.

April 19.

A Point Scale for the Measurement of Intelligence in Adolescent and Adult Individuals. R. M. Yerkes.
A Trained Nurse. G. Torrance.

Bulletin of the Johns Hopkins Hospital, Baltimore.

XXVIII. April.

The Recent Epidemic of Infantile Paralysis. Haven Emerson.

Journal of the American Medical Association, Chicago.

LXVIII. April 7.

Public Health Training in Universities. G. E. Vincent.
The After-Care of Infantile Paralysis. R. W. Lovett.
The Nutritional Value of the Banana. Meyers and Rose.
The Cultivation of a Micrococcus from the Blood in Pre-Eruptive and Eruptive Stages of Measles. Ruth Tunnicliff.

April 14.

The Bacteriology of Foods. E. O. Jordan.
Diphtheria in a School for the Deaf and Dumb: Report of an Outbreak. W. D. Stivall.
The Provocation of the Luetin Test in Nonsyphilitic Patients. Cole and Paryzek.
A "Luetin" Reaction in Syphilis Produced by Agar, with a Brief Consideration of Its Mechanism. J. H. Stokes.

April 21.

Acute Poliomyelitis. George Draper.
Use of Thymol in Treatment of Hookworm Disease. B. E. Washburn.
An Epidemic Resulting from the Contamination of Ice Cream by a Typhoid Carrier. J. G. Cumming.
The Isolation of the Bacillus Typhi-Exanthematici from the Body Louse. Olitsky, Denzer, and Husk.

Journal of Bacteriology, Baltimore.

II. March.

A Study of the Diphtheroid Group of Organisms with Special Reference to their Relation to the Streptococci: I. Characteristics of a Peculiar Pleomorphic Diphtheroid. R. R. Mellon.
The Colorimetric Determination of Hydrogen Ion Concentration and Its Applications in Bacteriology. Clark and Lubs.
Soil Flora Studies. H. J. Conn.
Studies in the Nomenclature and Classification of the Bacteria: II, The Primary Subdivisions of the Schizomycetes. R. E. Buchanan.
The Evolution and Relationship of the Great Groups of Bacteria. I. J. Kligler.
A Study of Five Members of the Septicemia Hemorrhagica Group of Organisms with Special Reference to Their Action on Carbohydrates. A. M. Besemer.
Large Numbers of Bact. Abortus Var. Lipolticus Which May Be Found in Milk. Alice C. Evans.
Creatinine Production in B. Coli and B. Typhi. H. J. Sears.

Journal of Laboratory and Clinical Medicine, St. Louis.

II. April.

A Preliminary Medical Study of the Positive Cases Found in the First Year's Work of the Michigan Tuberculosis Survey. V. C. Vaughan.
Spirochaetes. Hideyo Noguchi.
Use of Fehling's Solution in the Determination of Blood Sugar. H. McGuigan.
Clarification of Complement in Relation to Its Preservation. N. E. Williamson.

Journal of the Outdoor Life, New York.

XIV. April.

How Connecticut Beat the Devil. A Fable. S. J. Maher.
Women's Clubs and Tuberculosis. Otto R. Eichel.
Relation of the Sanatorium and the Patient. J. S. Ford.
Settlement Laws as an Element in the Solution of the Problem of the Migratory Consumptive. Gertrude Vaile.

Medical Reviews of Reviews, New York.

23. April.

Focal Infection in Orthopedic Practice. A. Cohm.
The Increasing Menace of the Conventional Shoe. J. Grossman.
On the Reporting of Venereal Infections. H. Crutcher.
Why I Believe in Active Principle of Therapeutics. J. M. French.
Alcoholism as a Public Health Question. G. W. Robinson.

Medical Times, New York.

XLV. April.

Preventive Medicine and Birth Control. S. A. Knopf.
Some Practical, Religious, and Sociological Aspects of Child Adoption. B. B. Brown.
Grippe and Colds. I. W. Voorhees.
Are Municipal Hospitals Unwilling Aids to Abortionists? J. C. Murphy.
Open Air Schools and the Moral to be Inferred Therefrom.

Military Surgeon, Washington, D. C.

XL. April.

Mental and Physical Activity with Reference to Nutrition and Blood Pressure. R. G. Heiner.
Civil Physicians and National Defense. H. Page.
Present Status of Artificially Treated Drinking Water in the Field. William Lyster.
Physical Examination of Large Bodies of Men. Charles Willcox.
Occurrence of Endamebic Dysentery, etc. C. F. Craig.

Modern Hospital, St. Louis.

VIII. April.

Model Hospital Established and Managed by Chinese. Wu Lien-teh.
Hospital Work in the Island of Porto Rico. E. R. Hildreth.
Skim-Milk as Food. J. P. Street.
Standardization of Hospitals—Introduction and Classification. J. A. Hornsby.
Hospital Organization in Rural Pennsylvania. H. L. Foss.

New York Medical Journal.

CV. April 7.

Modern Conception of Inebriety. M. S. Gregory.
The Mentality of the Alcoholic. S. E. Jelliffe.

April 14.

Newer Aspects of Infection in Pneumonia. E. Steinfield.
Administrative Control of Sick Indigents. C. Barker.
More Light on the After-treatment of Poliomyelitis. A. C. Geyser.

April 21.

The Four Plus Wassermann. D. M. Kaplan.
Drug Addiction and the Harrison Antinarcotic Law. J. C. Densten.
The Place of the Psychiatric Clinic in a Prison System. B. Gluck.

April 28.

Pneumococcic Peritonitis in Infancy and Childhood. I. A. Abt.
Channels of Infection and Methods of Transmission of Tuberculosis. W. H. Park.

Value of Early Vaccine Treatment of Pneumonia. G. H. Sherman.
A Municipal Birth Control Clinic. M. H. Kahn.
The Nature of Resistance to Tuberculosis. A. K. Krause.
Dietetic Fads and Fancies. J. E. Lind.

New York State Journal of Medicine.

17. April.

Health Center Field Work. A. C. Schaefer.
Economic Foundations for Health. B. C. March.
Importance of Diagnosis to Vital Statistics with Special Reference to Cancer. J. S. Lewis.

New Orleans Medical and Surgical Journal.

69. April.

Hookworm Investigation in the Antimony Mines, Sinhwa, Hunan Province, China. W. S. Chow.
Eighteen Months' Observations on the Mental and Physical State of Children Following the Removal of Tonsils and Adenoids. C. J. Bloom.

Public Health Journal, Toronto.

VIII. March.

Value of Milk Depots. Jules Tessier.
Meningococcus Meningitis. J. T. Fitzgerald.
Modern Conception of Fumigation after Communicable Disease. F. Adams
Economic Value of Preventive Medicine. J. O. McCarty.

April.

The Problem of Illegitimacy—The General Practitioner's Point of View. W. F. Clark.
Illegitimacy—The Attitude of the Social Worker. Miss M. J. Kniseley.
The Nurse Midwife. F. J. Taussig.
Survey of the Spreading Health Insurance Movement. I. M. Rubinow.
Principles of Sewage Treatment. J. R. Ellis.
Infantile Increase and Child Conservation. H. B. Weston.

Public Health Nurse Quarterly, Baltimore.

IX. April.

The Public Health Nurse and the Social Worker. Mary S. Gardner.
Community Responsibility for the Dependent Child. H. L. Leete.
Contagious Diseases—A Résumé of Public Health Nursing and Preventive Measures. Charlotte Ludwig.
Caring for Contagious Cases in District 1, Cleveland. Pearl Kamerer.
Public Health Nursing and Its Administration: Municipal and Private Control. Mary Beard.
Work of the Social Service Department of a Large Manufacturing Company. Gertrude Kinzer.
School Nursing in a Small Town. Amy F. Lowe.

Psychological Clinic, Philadelphia.

XI. April.

A Picture Arrangement Test. A. C. Bowler.
The Feeble-Minded in the State of Missouri. J. E. Wallace Wallin.

Safety Engineering, New York.

XXXIII. March.

Sanitation in Great Industrial Plants.
Industrial Accident Prevention. L. A. Beagle.
Committee on Health and Safety.

April.

Explosives and Other Dangerous Articles in Transportation.
Hazards of Locomotive Engineers. F. S. Crum.
Amazing Story of Pittsburgh's Neglect. W. E. Mallalieu.
Siphons and Safety. R. L. Morrow.
About Boiler Safety. R. L. Hemingway.

Southern Medical Journal, Birmingham, Ala.

X. April.

Transmissibility of Pellagra. J. Goldberger.
The Pellagrous Intestine and Some of Its Parasites. K. M. Lynch.
Is the Average Physician Making Satisfactory Progress in the Early Diagnosis in Pulmonary Tuberculosis? J. H. Way.
Tuberculosis: A Disease of Children. F. C. Moor.
A Plea and a Plan for the Eradication of Malaria. F. L. Hoffman.
Infantile Paralysis. W. A. Evans.
The Wassermann Test in Public Health Work. F. A. Coward.
Ophthalmological Clinics. E. C. Ellett.
Tonsil and Adenoid Clinics. M. M. Cultom.
Hay Fever and Its Prevention in the Southern States. William Sheppegrell.

Survey, New York.

March 31.

A Canadian City in War Time: III, Way-Marks in Organized Giving. Paul U. Kellogg.
Nine Years of the Canadian Industrial Disputes Act. B. M. Selekman.

April 7.

A Canadian City in War Time: IV, Battle-Ground for Wounded Men. Paul U. Kellogg.
Rebuilt Men. Bruno Lasker.
Learning for Earning or for Life? W. D. Lane.

April 21.

Output and Hours. Henriette R. Walter.
Task of the Civilian War Relief.
A Canadian City in War Time: V, Recruiting and the Man-Poer Inventory. Paul U. Kellogg.
The New Public Health. III. Alice Hamilton and Gertrude Seymour.
Breweries vs. Bakeries. Eliz. Tilton.

April 28.

Medicine Mobilized. Gertrude Seymour.
Task of Civilian War Relief. II.
Reorganizing the State Board of Charities in New York. W. D. Lane.

Texas Medical Journal, Austin.

XXXII. April.

A Method of Controlling Preventable Diseases in Rural Districts. A. C. Ellis.

U. S. Public Health Reports, Washington, D. C.

32. March 30.

Court Decisions Pertaining to Public Health in 1916. Jason Waterman.

April 6.

Longevity.
Notification of Disease in Florida.

April 13.

Prevalence of Typhoid Fever in Cities during 1916.
Anopheline Mosquitoes. Their Distribution and Infection Under Field Conditions. M. B. Mitzmain.

April 20.

Poliomyelitis: Prevalence in Cities during 1916.
Detection of Hydrocyanic Acid Gas. Use of Small Animals for the Purpose. S. B. Grubbs.

BRITISH.

Journal of State Medicine, London.

XXV. March.

Prevention and Arrest of Venereal Disease in Women. Mary Scharlief.

Prevention and Arrest of Venereal Diseases in Man. C. J. Macalister.

Medical Officer, London.

XVII. March 10.

A Central Association for Instruction in Infant Hygiene and Feeding. G. T. Beatson.

March 17.

Emergency Vaccination Officers.

Sanitary Disposal of the Dead.

Alcohol as a Cause of Insanity.

Infant Welfare Work. R. Fraser.

March 24.

British Medical Association Memorandum on Venereal Diseases Schemes.

Ice Cream and Enteric Fever.

Use of Curative Sera.

Campaign against Venereal Diseases.

March 31.

Ophthalmia Neonatorum Nursing in London.

Some Demons of the Twentieth Century. J. Foster Palmer.

April 7.

Delayed Tuberculosis Infection.

Infant Welfare Conference at Glasgow. Continued.

BOOKS AND REPORTS RECEIVED.

The Nation's Health. By Sir Malcolm Morris, M. D., K. C. V. O. Funk & Wagnalls Company, New York. 1917. 150 pp. Price, $1.25 net.

Cancer: Its Cause and Treatment. B. L. Duncan Bulkley, A. M., M. D. Paul B. Hoeber, Publisher, New York. 1917. 12 mo. cloth, 250 pp. Price, $1.50 net.

The Internal Secretions. By Dr. E. Gley. Translated from the French and edited by Dr. M. Fishberg. Paul H. Hoeber, Publisher, New York. 1917. 12 mo. cloth, 240 pp. Price, $2.00 net.

Therapeutics and Preventive Medicine. Volume VIII of the Practical Medicine Series, 1916. Edited by George F. Butler, M. D., and W. A. Evans, M. D. The Year Book Publishers, Chicago. 380 pp. Price, $1.50 net. Price of series of ten volumes, $10.

Administration of Child Labor Laws. Part 2, Employment-Certificate System, New York. By Helen L. Sumner and Ethel E. Hanks. Publication No. 17 of the Children's Bureau of the U. S. Department of Labor.

Workmen's Compensation Laws of the United States and Foreign Countries. Bulletin of the United States Bureau of Labor Statistics, Whole No. 203. 1917.

Court Decisions on Workmen's Compensation Law, July 1, 1914–August 1, 1916. Prepared by the Bureau of Statistics and Information, of the Department of Labor of the State of New York. Special Bulletin No. 81, March, 1917.

Labor Injunctions in Massachusetts. Labor Bulletin No. 117, of the Bureau of Statistics of the Commonwealth of Massachusetts.

Seventh Biennial Report of the Bureau of Labor Statistics of the State of California. 1915–1916.

Transactions of the Chicago Society of Internal Medicine. February, 1917. Vols. I and II, Nos. 1 and 2.

Tuberculosis Families on Their Homes. A Study by the Association of Tuberculosis Clinics and the Committee on the Prevention of Tuberculosis of the Charity Organization Society of New York City.

American Journal of Public Health
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MILITARY SANITATION IN THE PRESENT WAR.

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PREFACE.

The present war has produced only two small books dealing with military hygiene and sanitation. They present briefly and concisely many of the solutions to perplexing problems which war conditions have caused, and indicate many new phases of sanitary endeavor and accomplishment.

One of these books—"Sanitation in War," by Major Lelean of the British Medical Corps, is a compilation of nine lectures given during the war at the R. A. M. College. These treat of the generalities of war-time sanitation and consider such topics as physical fitness of soldiers, anti-typhoid inoculation, hygiene of the march, water supply, rôle of insects, etc. It is, so far as the writer is aware, the best short manual on sanitation which has yet appeared in the English language.

The other book was published only last year (1916) and is entitled "La Pratique de l'Hygiene en Campagne" by Andre Tournade of the French Sanitary Service School.

This book of two hundred pages is quite detailed, and considers a great variety of matters in very brief style. It is the most complete, and yet brief, handbook on the general subject of military hygiene and sanitation which has yet appeared. It is full of many valuable hints and advice growing out of experience in the present war.

Neither of these books are published in the United States (although "Sanitation in War" is handled by Blakiston, Philadelphia) and no translation of the "Practique de l'Hygiene" has yet appeared. On account of the valuable information, of such immediate utility just now to sanitarians in the United States, the writer has made brief abstracts of the more useful and novel features of these two books. The French book especially has been quite fully abstracted, omission being made chiefly of material concerning medical rather than sanitary practice.

The intention has been to give only such matter as is likely to be new to American readers and not readily found in current treatises. For this reason common practices in military sanitation have been deliberately omitted, and the following notes do not pretend to be a complete exposition of the subject. This article has been prepared in the hope that some new ideas from the war zone may be brought to the attention of American sanitary officials for use in the present crisis. For more detailed comment readers are referred to the original sources.

INDEX.

SUBJECT	PAGE
1. Baths	528
2. Battle Field Sanitation	528
3. Beds (Temporary)	528
4. Bivouac	528
5. Burial of the Dead	529
6. Cantonments	530
7. Care of Quarters	530
8. Cooking	531
9. Diseases of Armies	531
10. Disinfection	533
11. Excreta Disposal	534
12. Exhumations	536
13. Flies	536
14. Garbage	536
15. Personal Hygiene	536
16. Rations	538
17. Rats	539
18. Stretchers	539
19. Vermin	539
20. Voluntary Infection	540
21. Water Supply	541
22. Water Purification	544

MILITARY SANITATION IN THE PRESENT WAR.

1. Baths [*F*].*

THE author states that wherever men are encamped for any length of time, baths should be installed with both hot and cold water. An indispensable adjunct of these is said to be a hair dresser (coiffeur) who "will complete the toilet of the men by trimming their hair"!

The Tub.—Where conditions must be most primitive small vats or tubs that happen to be at hand may be used. The water is warmed on the cook fire and the men are brought in groups of ten, made to undress and are scrubbed. In especially unfavorable conditions in cold weather the bathing may be done in the stables where the heat from the animals will maintain a comfortable temperature.

Shower-baths.—A unique arrangement has been devised for the vicinity of the trenches (Figure 1). More elaborate arrangements are provided for permanent encampments. There are also in service some bath trains, fully equipped for sterilization of clothes, bathing of men, etc.

2. Battle Field Sanitation [*F*].

This comprises:

(1) *Burial of corpses,* and amelioration of conditions arising from previously imperfectly buried bodies. This task is important and influenced by the condition of the country, the geology of the place, and the regard for pollution of underground waters.

(2) *Burial of human corpses with quicklime* and incineration of animal corpses and general organic filth.

(3) *Disinfection of polluted wells.*

(4) *Disinfection of field hospitals.*

3. Beds (Temporary).

The French have found that two wooden horses placed at each end, a woven brush or reed matte placed between and a mattress on top furnish quickly available emergency cots.

4. Bivouac [*F*].

During bivouacs the Sanitary Service is concerned in the construction of shelters. It is stated that several

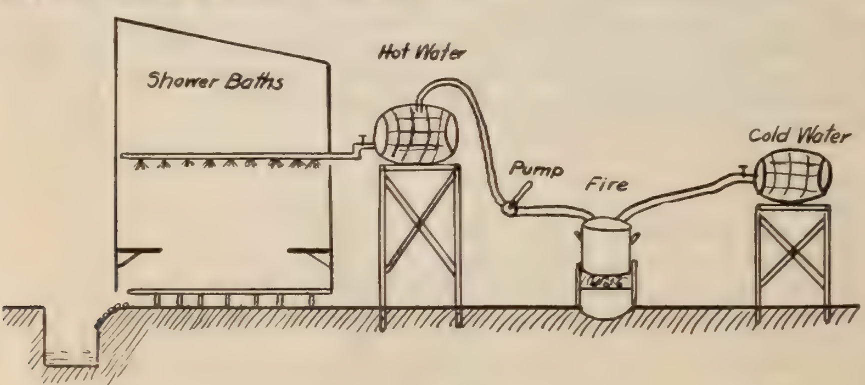

Figure 1

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* Matter taken from "Practice de l'Hygiene" is prefaced thus [*F*]. That from "Sanitation in War" by [*B*].

sheets of newspaper placed inside the shirt makes excellent insulation against cold, especially if it is impossible to have fires.

5. Burial of the Dead [*F*].

The disposal by burial of the enormous numbers of dead on the field of battle presents no inconsiderable problem. The French have promulgated the following rules for burial in ground recently evacuated by the enemy:

A convenient site is chosen, as near as possible to where the men have fallen. Corpses should not be buried near farms, sanitary structures, roads, rivers, water courses, or in places likely to be flooded. A silicious or calcareous region, dry, permeable, slightly sloping and studded with trees is the best, if available.

Unless specifically disapproved, common graves, holding 100 bodies, are used. Two principles should be observed in digging the trench: (1) Easy access of air, and (2) provision for circulation of ground water. These principles must be observed to promote bacterial growth and hence rapid decomposition. By the same token, use of antiseptics on the bodies is ordinarily forbidden. All clothing is removed from the bodies before burial, if decomposition is not too advanced. The ditches shall contain only a single row of corpses, and shall be of the following dimensions: 1.60 meters deep, 30 meters long, 3.5 meters wide (In English measure roughly 5′ deep, 100′ long, 11′ wide). The main trench is drained by a small ditch in the bottom, about 1 foot deep and lined with branches. stones, etc.

At the highest point of the burial ditch, an opening is left, to serve as a sort of chimney for the gases of putrefaction. It is well to cover the corpses first with branches, then the useless clothes, then charcoal, then turf, then earth; the whole forming a depth of three to five feet, and making a low mound.

The disposal of the dead lying between the enemy's lines and the first trenches, and of those dead in the trenches, is a difficult problem, and one often insurmountable. Putrefaction of the bodies in the open air is not uncommon. So far as possible bodies are brought in under cover of night, and properly disposed of.

When the burial of bodies becomes impossible, or when in advancing over new territory, recently interred bodies are uncovered, it is best to treat them at once with an abundance of quicklime, or ten per cent. ferric sulphate. Better yet to treat with a 1/20 creosol or formalin solution. A chloride of zinc solution, followed by ferric sulphate produces anti-septic, mummifying and larvicidal conditions.

One cannot help but join in the British lament over the unreasoning sentiment which thus far has prevented the incineration of dead bodies. If popular feeling were such that the bodies of those slain in battle could be incinerated, a vast deal of time and trouble would be eliminated, and much more sanitary conditions achieved. In this connection it is interesting to note that reports continually reach this country concerning the rendering of dead bodies by the Germans. The horrified American press has devoted considerable space to the activities of the "Corpse Utilization Establishment (Kadaververwertungsanstalt) at Evergnicourt." It it alleged that the dead bodies are fastened in bundles of three or four with iron wire and despatched to the rendering establishment. Here they are rendered, the products being a lubricating oil won from the fats, and a compressed "stick" which is used as fodder for hogs. The German government has denied that human bodies were thus treated, the Allied governments have affirmed it. In any event such a method of disposal would seem as satisfactory as burial of the dead in a common grave where the bodies may not only decompose and render foul the ground and water supply, but also interfere with subsequent military operations.

6. CANTONMENTS [*F*].

The hygiene of a cantonment comprises the following preliminary factors:

1. *A sanitary survey*—conducted by a doctor, and including the epidemiological history of the place, quality of the water, health of the inhabitants, etc.

2. *An estimation of the capacity of the place* and its provisions (sanitary and otherwise) for receiving men and horses.

The three main considerations before the sanitary officer after occupation of the cantonment are:

1. *Protection of the Ground.*—The first necessity is the provision of temporary latrines, that the men may not pollute the soil or gardens or create offenses near houses. The regulation latrine ditches should be made as soon as practicable. Care should be taken to prevent stagnant pools of urine or wash water in the ditches. The disposal of organic filth and refuse from kitchens and slaughtering places is best accomplished temporarily by treatment with quicklime. This indeed seems the panacea most used by the French for a considerable variety of sanitary ills. They use it to a much greater extent than either the British or Americans. Stable refuse is carefully carted at least a kilometre distant and in a direction opposite to the prevailing winds. There it is dumped on the fields. Surface drains should be among the first permanencies of any camp.

2. *Provision for Pure Water.*—The general rule is to consider all water polluted, and to sterilize it. Signs are posted stating "Dangerous Water" or "Drinking Water." Such signs as "Rinsing Water" or "Wash Water" are absolutely forbidden. Sterilization is accomplished by hypochlorite of lime or permanganate of potash. The British do not favor the use of the latter.

Secondary cares are measures taken to allow men to perform their toilet and to wash their clothes. Indeed the French seem peculiarly concerned lest the men be not able to shave and get a hair cut. This care for the individual comfort of the soldier is a matter of detail about which both French and English officers devote an increasing amount of time and thought.

7. CARE OF QUARTERS [*F*].

The use of whitewash is apparently very extensive in the French army.

Not only are all temporary outposts, stables, barracks, etc., kept whitewashed, but elaborate methods have been devised for the preparation of screened partitions for field hospitals or barracks, which consist essentially of a linen cloth fastened on a wooden framework and whitewashed. A sanitary and translucent (but not transparent) partition is thus obtained. The whitewash is most successfully applied when there is added to it 1 to 2 grams of alum per litre, as this facilitates adhesion. Whitewashed linen mounted on framework serves many uses under front-line conditions, as for barriers, screens for privies, screens for officers' quarters, the foundation of barricades, litters, etc.

8. COOKING.

The great problem at the front is to make cook fires or to cook without producing smoke. The French mention only that they use charcoal or coke in a brazier for this purpose. These the soldier uses for cooking and heating. The French also use so-called "solidified alcohol" prepared by mixing 100 cc. of denatured alcohol with 30 grams of a special soap.

The English have now in use a travelling kitchen of the "heat retaining" type. This consists of heat insulated ovens and compartments arranged around a central furnace, the whole mounted on two wheels. It is drawn by two horses, weighs 2,400 lbs., and cooks for 250 men and officers. Before starting the march the food is placed in the ovens, etc., the fire is lighted and vigorously stoked for over an hour. On starting the march the fire is drawn or damped. Cooking proceeds in the insulated compartments during the march.

9. DISEASES OF ARMIES [*F*].

Typhoid.—The prevention of this former scourge of armies by compulsory vaccination with anti-typhoid vaccine is so well understood and so successfully practised in the United States Army that few data are needed here. The British have used two injections at ten-day intervals, one of 500 million dead bacilli and the second of 1,000 million. The French have found that two injections does not always protect, and use four injections at intervals of seven to ten days. The numbers of bacteria per cc. used in the French vaccines is not stated, but the first dose comprises ½ cc. of vaccine, the second 1 cc., the third 1.5 cc. and the fourth 2.0 to 2.5 cc. Only men in good health are inoculated, and they are given one day off duty following each injection. The French give a .5 centigram aspirin tablet one to two hours after the injection. If local reaction is excessive the English give 30 grains of chloride of calcium (or 15 grains calcium lactate) just before and six hours after the inoculation.

Diarrhea and Dysentery.—The predisposing conditions in the present war are said by the French to be: the long stationing of large numbers of troops in the same place with consequent severe infection of the ground and water; the diet having too much meat, or, in summer, the ingestion of too many green vegetables by men who are careless of their alimentary hygiene; the cooling of the stomach consequent upon careless removal of the flannel belt or from lying on damp ground; and sometimes also the ghastly conditions in the trenches.

The expressions "diarrhea of the trenches" and "dysentery" are used loosely to cover many intestinal infections, from typhoid, or more often paratyphoid, through gastric diarrhea, enteritis and hemorrhoids, to true dysentery. Only bacteriological examination makes differentiation certain. and such examination should always be made if possible, that proper measures of control of the infection may be taken. The chief precaution is to thoroughly disinfect all discharges from patients having diarrheal affections.

Trench Jaundice.—This is one of several names given to an apparently new disease which is rife in the trenches. "It is characterized by sudden onset of malaise, intense muscular pain, high fever for several days, followed by jaundice, and is frequently accompanied by subcutaneous hemorrhages and other complications." It is claimed that Dr. Noguchi of the Rockefeller Institute has demonstrated the germ of this disease in rats, both those infesting the trenches and those at some distance from them, and that he attributes the spread of the disease in some way to the presence of rats carrying the germ.

Cholera.—This disease is endemic in certain regions controlled by the Central Powers and precautions must be taken by advancing Allied troops. All prisoners are subjected to careful scrutiny, and if suspected, to bacteriological examinations and isolation. General precautions are those of sanitation of the trenches and disinfection of excreta in latrines, trenches or elsewhere. A careful diet, free from fruits and uncooked vegetables, with sterilized water, are additional safeguards and prophylactic measures. The Germans have successfully used anticholera vaccination in the present war, and the French are about to adopt it in suspected regions.

Typhus.—This disease being spread by the body louse or tick, the following measures for its suppression are in use by the French:

1. Disinfection of cantonments abandoned by the enemy, and medical supervision of prisoners for suspected cases. The disease is rife in both the German and Austrian armies, and as troops are transferred from place to place, the utmost care is necessary to prevent its introduction.

2. Community measures. Inspection of premises and personal effects of the soldiers; installation of stations for disinfecting clothing of vermin; installation of shower baths.

3. Precautions for suspects. Caresul delousing of hair and clothes by fpecial contrivances; isolation of the suspect or patient; enforcing absolute asepsis by means of special clothing, etc., on all the medical personnel; general sanitary precautions to isolate the buildings containing suspects and patients.

Removal of lice from head is effected by an ointment of kerosene and olive oil, equal parts, rubbed on head and washed off in 24 hours, also benzene, kerosene, or 10 per cent. acetic acid alone are effective. Lice in clothing are removed best by powders, one of which is of 2 per cent. iodoform and creosote and 96 per cent. naphthaline. The young are destroyed by smearing seams with a grease of mineral oil 9 parts, soft soap 5 parts to water 1 part. Steaming or heat treatment is also efficacious.

Directly contagious diseases, as measles, scarlet fever, diphtheria, cerebro-spinal meningitis have all been prevalent in the armies in the field. Protective measures are diagnosis, isolation, removal of the patients and disinfection of premises.

Venereal Diseases.—An increase in these diseases has been noted during the war. Infection occurs not at the front, or at the temporary halting places, but in soldiers on leave in the Interior and at the Depots. Clandestine prostitution is held to be responsible, combined with the letting down of the soldiers' moral tone with relief from trench warfare and the knowledge that he soon must return to it. Active measures of education by doctors under the auspices of the Academy have been inaugurated. Meanwhile the usual measures are taken to combat these diseases in the army. The equivalent of two army corps are said to be continually incapacitated from these diseases.

10. DISINFECTION [*F*].

For dry antiseptics the French use chloride of lime (as a deodorant), ferric sulphate (to prevent fermentation) and quicklime (to destroy organic matter).

Formalin solutions are commonly used as body disinfectants in washing, etc. Of other antiseptic solutions only the following are considered satisfactory for field use.

Chloride of Lime.—This is prepared by adding little by little 100 grams of chloride of lime to a litre (=1 quart approx.) of water, then diluting with water to 10 times the volume. The strength of this antiseptic is considerably increased when heated. The solution attacks all metals.

Corrosive sublimate ($HgCl_2$) one to one thousand. The addition of 2 grams of sea-salt per litre (quart) adds to the efficacy by hindering the coagulation of albumen.

Heavy coal-tar oils in emulsion with water in proportion of 50 to 100 per 1,000 constitutes primarily deodorants and is especially valuable in the urinals.

Disinfection by steam or liquids is made of all bed clothing and linen after use by a patient, even though the patient has the same disease. This is done to prevent secondary infection as from broncho-pneumonia, grippe, etc., when the original infection may have been measles or scarlet fever. It is interesting to note in this connection that the French recognize broncho-pneumonia as a contagious disease.

For sterilization of dejecta, prolonged contact with 5 per cent. solutions of copper sulphate, 2 per cent. or 3 per cent. creosol, or 4 per cent. chloride of lime is used.

The British use for field disinfection a portable Thresh steam disinfector—capable of sterilizing 60 blankets at 100° C. The standard disinfectant used in the field is Liquor Cresoli

Saponatus, having a carbolic coefficient of 12. It forms a stable emulsion and is used in proportion of one and one-half ounces to the gallon of water. Carbolic acid and formalin are also used in proportion of eight ounces of either per gallon of water.

Disinfection by formaldehyde and sulphur dioxide is widely practiced. The processes are similar to those used in the United States and will not be described. In these ways disinfection is made of all hospital wards after contagious cases, including rooms, halls, vestibules, etc.; also of ambulances which have carried contagious cases.

For disinfection in the dry, use is made of either of the following arrangements:

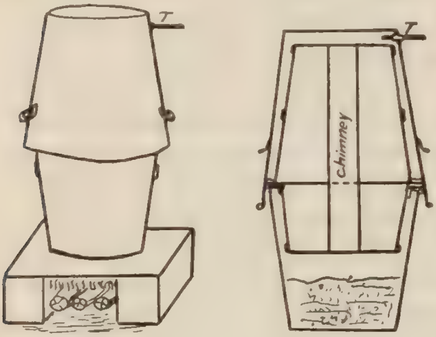

Figure 2

The first (Figure 2) consists merely of two conical parts, one inverted over the other. A closed chimney passes through the center and a thermometer opening is left at the top. The clothing or other things to be sterilized are placed around the chimney and a temperature over 100° C. is attained. The temperature recorded by the thermometer, however, is not that which obtains in the interior of the cones and it would be better to insert it half-way down the cone.

A more elaborate arrangement (Figure 3) is that of Doctor Bordas, consisting of a retort filled with water. The steam generated passes through spiral lead pipes coiled about the inside of a wooden cask. Material to be sterilized is placed in the inside around a cylindrical log of wood which is stuck up through the center. When ready for use the log is withdrawn, the cover made tight and steam turned on. Temperatures of 106 to 108° C. are attained.

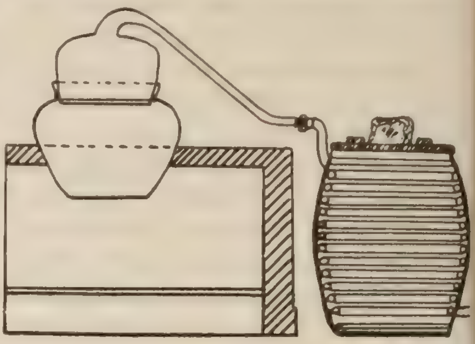

Figure 3

11. Excreta Disposal.

In General.—For more or less temporary encampments the shallow straddle trench has found favor both with French and British. These are essentially as used in this country on maneuvers. It is specifically stated by the English that dirt should be heaped on both sides of the trench to force the men to straddle. Otherwise the ground nearby becomes foul with urine and the men stand farther and farther away from the trench.

The English have now come to use soakage-pits for urine. The pit, a three-foot cube, is excavated, and the soil at the bottom is loosened. The pit is filled to nearly the top with graded stones. When a suitable height is reached funnels are inserted in each corner at a convenient height. In this way fouling of the surface is eliminated and access of flies to the urine is prevented.

In the Trenches.—Here the safe disposal of excreta is a great problem. Space is at a premium, and the frequent digging of shallow straddle pits often impossible. The French excavate a deep pit, well behind the trench line. The pit is constructed parallel to the trench line and space is left for additional pits as shown dotted in the diagram, Figure 4. The communication is by means of a lateral trench some fifty feet long at right angles to the main trench. The passage way must slope *from* the main trench to prevent flooding of the latter with excrement in case of heavy rains. The pit is dug to a depth of two and one-half or three metres (8–10 feet). Around the pit is constructed a firm platform, with well-defined places for the hands and feet of men using it, and triangular openings. When the pit is three-quarters full, it is covered with brush, some coal tar deodorant is put in, and another pit is dug in front. After use the men should be instructed to throw dry earth on the dejecta. Three times a day some disinfecting and deodorizing substance should be thrown in.

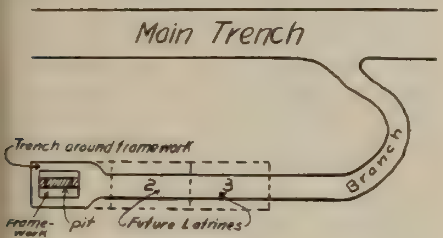

Figure 4

The French also—under some conditions—provide troughs in which liquid disinfectant is kept. The excreta are deposited here, and kept until disinfecting action has progressed to a point where they may be dumped in a pit without offense.

The English have not found pits to work well in the trenches, due to frequent flooding. They therefore place buckets in bomb-proof dug-outs. The buckets are removed by the relieved troops, who bury the contents and bring the buckets with them on their return.

An unofficial method of disposal is said to have consisted in placing excreta in empty tins and tossing them into nearby enemy trenches. Reprisals in kind, however, were so unpleasant that the practice was abandoned by mutual consent.

In Camp.—The British have found that in all cases urine is best disposed of by soakage-pits. Feces can well and economically be disposed of by incineration if the following two points are observed, viz.: (a) the proper amount of absorbent refuse, and (b) the proper type of closed incinerator.

[*B*] "A battalion of standard strength of 1,000 men provides 600 lbs. of filth a day in the latrine buckets, 500 lbs. of this being liquid and 100 lbs. solid. Normally this is collected in 10 buckets of 60 lbs. each. The fluid in one such bucket is absorbed by 10 lbs. of sawdust, and the regiment thus needs 100 lbs. per day of absorbent matrix of the equivalent value of sawdust, to take up the liquid. . . . Since the total combustible refuse from a standard unit averages 1,500 lbs. per day, the unit should be practically self supporting in its incineration." Stable litter can always be incinerated.

12. Exhumations [*F*].

The French permit exhumations *only* on demand of the public authorities, and for hygienic reasons, as nearness to water sources, wells, or habitations. Exhumations ought always to be performed in cool weather when there are no flies. Before raising the last bit of earth over the corpse, it should be wet down with some antiseptic substance, as creosol or phenol. Occasionally the ditch is filled with water, and the corpses washed there. The exhumed bodies, having been identified, are immediately placed in light coffins and sealed by some bituminous covering. The bodies are then transported rapidly to the cemetery, where new graves should already have been prepared. These are well disinfected with quicklime. Those engaged in the work of exhumation and removal should be protected by rubber boots and gloves, and masks if necessary.

13. Flies.

Both French and British have taken energetic measures to prevent breeding of flies. The procedures are those commonly used, as destruction by poisons and fly-paper, larvacides, incineration of refuse, fly-proofing of quarters and protection of foods.

14. Garbage.

In all the foreign armies, incineration seems to be the accepted means of disposal. The open pit is commonly used in the field. As the methods are similar to those used in the United States Army no comment is made here.

15. Personal Hygiene.

The general measures for the practice of personal hygiene among officers and men is so well understood that mention is made here only of several special points which have been brought out by the present war.

[*F*] *Protection from Cold and Frostbite.*—Probably the greatest inconvenience and suffering in the trenches, not due to wounds by the enemy, have been caused by cold and frost-bite. These troubles begin by obstruction of sight, difficulty in speaking, feeling of fatigue, rigidity of muscles of the head and neck, weak pulse, finally suffocation and death. Occasionally men fall over suddenly and die.

Prophylaxis consists in abundant nourishment, with foods rich in fats, warm drinks and tonics, as tea, coffee, warm sweet wine. Alcohol (as whiskey) should not be given in the smallest dose. Clothing is important, and it is better to put on additional light impermeable clothing, than to wear heavy clothing in smaller quantity as the latter constricts the muscles and circulation. When on guard it has been found possible to practically button up two men in an impermeable coat of rubber, or some similar substance, the men keeping warm by their own bodily heat which cannot escape.

Treatment of general stroke from cold is to take the patient to a *cool* room (never near a fire), lay him on straw, open the windows, undress him, and rub him vigorously with snow or a wet cloth. Practice artificial respiration, inject diffusible stimulants as ether or oil of camphor. When the patient shows signs of returning consciousness, give a rubbing with alcohol, shut the windows, then administer a warm and slightly alcoholic drink.

To protect the hands from the extreme cold of the trenches gloves, even when lined with fur, are not sufficient. Thick woolen mittens, with place for thumb and forefinger (for use on gun) separate, are best. Then the forefinger can be pulled back and warmed by contact with the other fingers when not in use. Very severe sores, often ulcerating and exhibiting gangrene, may occur from neglected frost-bites. Above all frozen hands or feet *should be kept away from the fire.*

Probably the greatest inconvenience in the trenches has been from frostbite on the legs and feet. Both English and French armies have suffered severely and lost the equivalent of regiments of men from this cause alone. The term "frost-bite" is really a misnomer, as continued exposure of the affected part to cold water is the chief cause rather than actual freezing. So severe are these "frost-bites" that the loss of a leg or the enforced amputation of a foot are not at all infrequent.

To prevent frost-bite the following should be observed: avoidance of tight puttees; large, roomy, well-greased boots; two extra pairs of boots, two pairs of woolen socks frequently changed, felt or paper lining for boots, and, best of all, dry trenches. The British claim that the essential factor in "frost-bite" is prolonged contact with cold water, and that "superficial areas of gangrene are produced by the mechanical obstruction to surface circulation by imbibition of water by the skin during long standing in trenches."

Personal Cleanliness.—In theory at least the French insist much more strongly than the British upon the cleanliness of the soldier. More than once a day he is required to wash hands and feet, clean nails and comb hair. Mouth and teeth are washed, in the absence of a brush, with a soap solution and then rinsed. There should be a daily bath (see under Baths) or, lacking this, those parts of the body subjected to chafing on the march should be carefully washed. At least every week the men are required to take a shower bath. The soldier is also required to frequently wash his clothing.

For clothing the soldier should wear woolen undershirt and drawers, heavy if in cold weather, light if in warm, but always woolen. The shirt should be long enough to double up at the bottom over the stomach, as, according to the French, it is efficacious in preventing digestive troubles and diarrhea caused by cooling of the stomach. At least once a week underclothing should be washed. Where washing is being done, either a constant flow of water or frequent sterilization should be secured. To wash without shrinkage, blankets should be dipped rapidly in boiling water, rapidly washed in warm water, and rapidly dried without wringing.

The care of the feet is of first importance, and every regiment should have at least one expert chiropodist. Boots must be large enough to wear in them two pairs of socks, that nearest the skin being woolen. Boots should be oiled every night inside and out (castor or cod-liver oil is satisfactory) and two pairs are advisable if possible. Socks should be clean each morning, or if this is not practicable, they should be aired and turned inside out. When at a halt it is well to unlace or take off the boots. The French find a leather strap, outside the shoe, brought once around the lower part of the ankle, thence under the instep and buckled just on top of the instep (a figure 8 around the instep) to be of great help in easing the foot while marching. All blisters should be pricked at the end of the day, and they, together with any sores, painted with tincture of iodine [*B*] or a commercial formalin solution [*F*]. For corns, daily bathing in a solution of salicylic acid (60 grains), extract Cannabis Indica (8 grains) and flexile collodium (1 ounce) renders them hard and opaque, and in a few days they can be removed.

Water on the March.—This is a very important consideration, as too much or too little water are alike disastrous to the soldier's efficiency. The British consider that the normal average requirements are that the men should get one quart of water at the end of every seven and a half miles marched. The ordinary day's march is 15 miles, hence one refilling of the water bottles will be necessary. To prevent continual pulling at water bottles the men should be given plenty of well-sweetened tea or coffee before starting, and should be encouraged to chew on something (a bullet, pebble, etc.) during the march, as this keeps the mouth closed and hence moist.

16. RATIONS.

English.—The standard English rations are tabulated below:

	Field Ration.	Reserve Ration.
Protein	175 grams	180 grams
Fat	218 grams	80 grams
Carbohydrates	515 grams	326 grams
Calories	4,855	2,800

Fat has weight for weight, two and one-half times the caloric value of either carbohydrate or protein and should in cold weather be increased at the expense of the carbohydrate.

Sugar is, of course, the most readily oxidized muscle food available. Chocolate, which used to be given to increase the sugar ration, has been found too concentrated a food to be easily digested, and has the further objection of increasing thirst. At present jam, containing 50 per cent. sugar, is given when it is desired to increase the sugar ration.

The British believe in the limited and guarded use of rum in the ration. Two and one-half ounces per man per day are provided at the discretion of the medical officer. The author quoted advises the use of rum when alternative carbohydrates or appetizers as cocoa or soup are not available. It should only be given in specified amount, at the end of day with main meal and just before men can turn in for their night's sleep.

The standard "tinned ration" of meat and vegetables all stewed together in one tin is recommended to be served at least once a week, as the men are fond of the variety and appetizing flavor.

Fresh meat is best assimilated by use of stew, and the importance of variety in fare cannot well be overestimated.

French.—The French standard field ration gives a caloric value of 3,064, while that of the English is 4,855 (see above), that of the Russians 4,190 and that of the Germans only 2,801. The latter is considered inadequate and must have been supplemented considerably during the present war. The "Practique de l'Hygiene" does not give the calorific values of the several constituents of the ration, but goes in great detail into the weight (in kilograms) of nearly every element to be found in the daily ration. Detailed rules are also laid down for the examination of meat, both on the hoof and after slaughtering. These are rarely found in such books and hence are of value, for the medical officer should have some information regarding all methods of food inspection.

There seems some question as to the propriety, in a book of this nature, of detailed directions for preparing food to be eaten. Thus the proper ingredients for a palatable bouillon are said to be 1 pound of meat, 1 litre of water and 10 grams of salt, the whole brought to a boil and allowed to simmer for four hours. Such directions, running the whole gamut of culinary art, would seem more properly placed in a manual for field cooks, and are too often found in so-called manuals of sanitation.

17. Rats.

Destruction of rats is important in combatting bubonic plague which is carried by the rat flea. The safest poison is phosphorus, made up in 4 per cent. tablets, and sulphur dioxide is effective if it can be concentrated and confined. The French also use both a virus which is ingested by the rats eating treated food, and a toxic extract which is said to be efficacious. The French phosphoric paste is made by mixing 750 grams of flour with 750 grams of water and adding 8 grams of white phosphorus. To the mixture is added 150 to 200 grams of cheese paste and 100 grams of powdered sugar.

18. Stretchers [*F*].

Considerable attention is paid to the design and construction of stretchers. Perhaps the most important point is that stretchers must not be made too cumbersome to navigate trenches and that turns and intersections of trenches must be widened to allow passage of stretchers. See Figures 5 and 6.

19. Vermin [*B*].

The destruction of vermin of various kinds has been treated elsewhere, but it is thought the details of the British method of freeing soldiers from vermin may be of value.

Men are taken in batches, shed their clothing, and pass into a room where there are vats of hot water. The

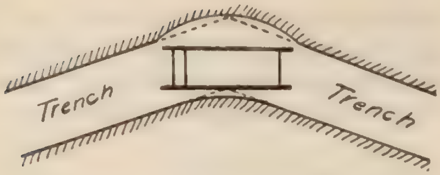

Figure 5

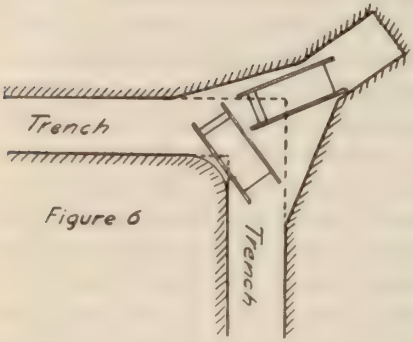

Figure 6

underclothing is removed and put into tubs of strong disinfectant while the men, ten at a time, get into the vats, and wash themselves thoroughly with soap. As water is at a premium, two lots of men use the same water which is thoroughly chlorinated between batches. On emerging from the bath the men rub themselves with lysol soft soap lather, then get rapidly into clean underclothing left by previously treated regiments and which have been sterilized and washed. While the men bathe, an army of women in an adjacent room are ironing the inner seams of the men's outer clothing, into which some lather has been rubbed. The men then dress themselves and march out. Where necessary the heads are washed in a mixture of kerosene and olive oil and the hair clipped.

20. VOLUNTARY INFECTION [*F*].

The French note that cases are not infrequent where soldiers, in order to escape their military obligations, will voluntarily expose themselves to infection, or, being ill with one disease, will attempt to contract another. Such cases are treated summarily by court martial as deserters or for insubordination. Maladies which are commonly provoked or simulated are:

1. Simulation of jaundice by ingestion of picric acid. Typical jaundice color and reactions are produced. Diagnosis is made by examination of urine for traces of picric acid. Simple examination is made by neutralizing 10 cc. of urine, then making alkaline with one drop of 10 per cent. caustic soda. Add five drops of 10 per cent. cyanide of potassium and on warming a red color appears if picric acid is present.

2. Provoked Conjunctivitis. This is attained by means of irritating powders as tobacco, ipecac, tartaric or boric acid introduced under the eyelid. The soldier explains his ailment by exposure to cold, irritating gas, etc. Diagnosis is only made by examination of his effects and discovery of ipecac, boric or tartaric acid.

3. Simulated Erysipelas. This is accomplished by rubbing the face with some irritating salve. Diagnosis is made by absence of fever and systemic reactions.

4. Provoked Abscess. This is effected by subcutaneous injections of kerosene, gasoline or turpentine. Diagnosis is by noting sterile character of pus, odor of the injected substance,

and chemical analysis of pus. Examination of the suspects' belongings brings to light the responsible agent.

5. Simulated Itch. Produced by pricking the spaces between the fingers with a needle and rubbing with salt. There are other simulated affections, but those given above are in greatest favor.

6. Venereal Disease. As has been stated elsewhere, there has been a very considerable increase in the frequency of venereal disease among the soldiers during the progress of the war. Some part of this increase has been attributed to voluntary infection by men who wish to get themselves invalided away from the trenches.

Men also sometimes refuse treatment or operation in the hope of prolonging their illness. Such cases must be treated according to the law of the land and as severely as possible. In addition soldiers may voluntarily wound themselves, either by shooting themselves in the hand or foot with captured weapons or even their own, or by voluntarily producing "accidental wounds" from machines, tools, gun mechanism, etc.

21. WATER SUPPLY.

Both the French and British manuals devote considerable space to the investigation of sources, supply, and purification of drinking water. That which is presented below gives the more important or novel features from both sources, that from the French being prefixed by a bracketed *F* and that from the British by a bracketed *B*.

[*F*] It is recognized that physical character of water is not an index of its purity, and that in judging of the purity of a water the following facts should be noted:

(a) Physical character (odor, taste, turbidity, etc.);

(b) Conditions under which it is received, collected, and distributed;

(c) Knowledge of the geologic character of the region both above and below ground. Regions of limestone or fissured rocks are always suspected;

(d) Chemical and bacteriological examination.

All waters which are not, or cannot from lack of facilities, be given a clean bill of health by a laboratory analysis, are suspected and are sterilized until proven pure. The French standards are give in Table I. In general they are lower than American standards.

[*B*] Bacterial and chemical examination in the field has been unheard of until the present war, but now motor laboratories are provided in which routine examination may be carried on. These complete laboratories are not sufficient to meet all needs and for reconnaisance portable boxes have been devised, containing necessary equipment to determine total number of organisms and minimum amount containing lactose-fractors for 16 samples per day. Eight test tubes are provided for each water—one of agar for the total count and seven of McConkey's taurocholate-lactose-litmus broth in amounts ranging from 0.5 cc. to 20 cc. The box contains also necessary incubator and sterilizer. All accessories and materials for examination of 500 samples are carried in another box. The total weight is little over 100 lbs.

TABLE I.

SIGNIFICANCE OF VARIATIONS IN COMPOSITION OF WATER.

(In p. p. m.)

	Very pure water.	Potable water.	Suspected water.	Bad water.
Total permanent hardness	5–15	15–30	>30	>100
Hardness after ½ hr. boiling	2–5	5–12	12–18	over 20
Saline residue (after 4 hours hours @ 110°C.)	<150	<400	400–700	>700
Chlorides as NaCl	<27	<66	85–165	>165
Chlorides as chlorine	<15	<40	50–100	>100
Sulphate as anhydrous $CaSo_4$	3–8	8–50	50–75	>85
Organic materials (as oxygen consumed by permanganate per million parts alkalinity)	1	2	3–4	>4
Nitrates	0	0–15	15–30	30
Nitrites	0	0	trace	appreciable quantity
Albuminoid ammonia	0	.05–0.10	0.11–0.15	>0.15
Bacteria	0–100 per cc.	100–1,000	1,000–10,000	>10,000
B. coli	0	1–10 per litre	10–50 per litre	>50 per litre

< = less than > = greater than.

and examination of 16 waters per day is possible. Table II shows the results of examinations of 290 waters from three classes, as follows:

TABLE II.

BACTERIAL EXAMINATION OF WELL WATERS IN RURAL DISTRICTS.

Class.		Total organisms per cc.	Least amount containing lactose fractors, cc.
Springs	(1)	50	39
	(2)	100	9
Wells	(1)	25	50
	(2)	70	5
	(3)	140	2.5

Class One.—Fully protected.

Class Two.—Imperfectly protected, but having no source of pollution within danger zone (taken as 30 feet or more for wells). This is better taken as 100 feet in the United States.

Class Three.—Imperfectly protected and having source of pollution within danger zone.

The whole value of this table lays in the compilation of average figures, to which a given examination may be referred and its relative degree of pollution indicated.

[*B*] *The water requirements of a military force are:*

(a) Each man requires per day the following:

In barracks	20 gals.
In standing camps, when clothing is washed	5 “
In camps, when no clothing is washed .	3 “
In bivouacs, for drinking and cooking only	1 “
For drinking only, as a minimum	3 pints
During the march (of 15 miles per day) . .	1 gal.

(b) The daily requirements for animals are:

Horse or camel	10 gals.
Ox	8 “
Mule	6 “
Donkey	5 “
Sheep or pig	2 “

[*B*] *To estimate the yield of a well,* lower the water level rapidly by pumping; then note the time to refill. Area of well = .785 (nearly $\frac{3}{4}$) × square of diameter. Cubic contents pumped out = area × depth refilled. Cubic contents × 6.23 (nearly $6\frac{1}{4}$) = no. Imperial gallons* yield in noted time of refilling. (Express results in gals. per 24 hrs.) To find yield from streams, get surface velocity from floating chip over measured length. Take four-fifths of this as mean velocity. Multiply this by sectional area to get discharge.

[*B*] The most likely place for water in hilly districts is the base of the steeper side of a deep valley, just below where the valley bifurcates. The most likely situations in a plain are the lowest depression and points where vegetation shows greenest, or the morning mist hangs longest, or the midges are most numerous.

Not the least valuable contribution of Lelean's "Sanitation in War" is a brief sketch of the geological formations of Northeastern France and Belgium in relation to the water supply. Such information is so difficult to obtain and may be of such immense importance to American troops that the salient features are reproduced below.

The area is divided into four geological districts. A plan of these is shown in Figure 7 and sections in Figure 8. Briefly the characteristics of the districts are as follows:

Area A. The limestone on top is fissured, and the resulting springs and wells are likely to be grossly contaminated. The underlying gravel yields pure water, but often of high color due to iron and organic remains.

Area B. The gravel yields abundant water, retained by the impervious underlying clay. The chalk where outcropping on side hills, etc., is fissured and allows water to percolate so rapidly that it is useless to bore for water on the higher chalk hills. The alluvial deposits in the lowlands are water-bearing, but often contaminated by manured lands.

Area C. The surface gravels are water-bearing, but the water is often heavily polluted and must usually be purified before drinking. The sand dunes toward the coast often yield water in wells driven in the center of the dune. The yield of such wells may

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* Multiply by 7.48 (or $7\frac{1}{2}$) to get United States gallons.

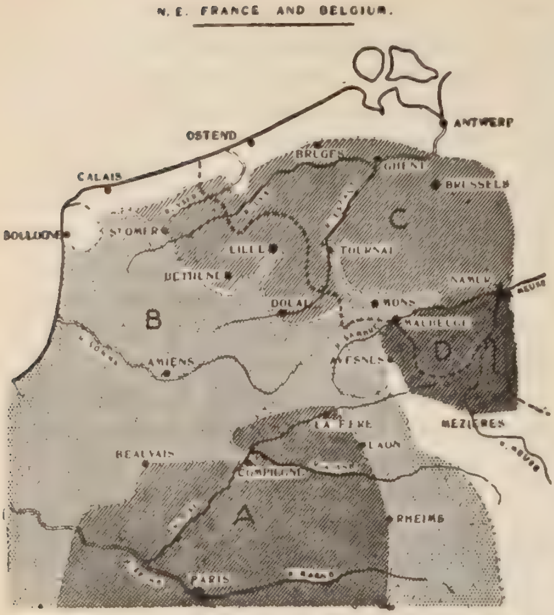


FIGURE 7

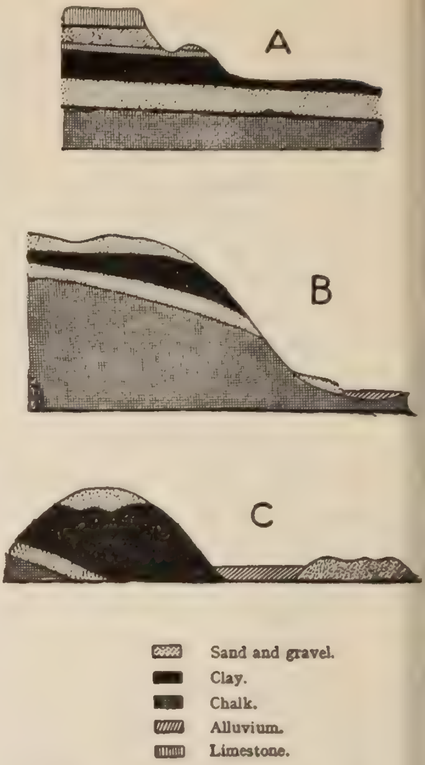


FIGURE 8

be increased by radial feeding trenches filled with stones and covered.

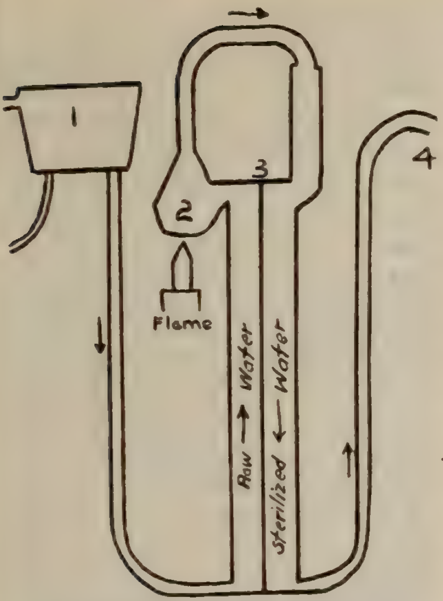
Area D. A mountainous region of limestone and chalk yielding a pure water readily obtained.

It is noted that the water supply of most Belgian towns has always been unsatisfactory and often from polluted sources. For this reason the advance of the Allied forces into Belgium is likely to lead to grave questions of water supply and purification for both civil and military populations.

22. WATER PURIFICATION.

Heat.—The simplest and most efficacious method is by boiling, and this is done in all temporary encampments. It is often best to make the water into weak tea which is a better thirst quencher and more palatable than boiled water. On the march British practice is to boil the water in kettles during the night. The water bottles are then filled and hence sterilized. A second boiling provides enough for the water carts. In the morning the unit moves with bottles full and carts containing refill for bottles, all water (or tea) being cool and sterile.

The most economical means of heat sterilization is by some apparatus whereby the heat of the outgoing sterilized water is given up to the incoming raw water. An apparatus similar to the Forbes-Waterhouse sterilizer in use in the United States Army has been used by the British but has been found unreliable, since the middle compartment may leak and raw



Forbes-Waterhouse Sterilizer
Figure 9

water get into the outgoing stream without detection. The principle is shown in Figure 9.

Filtration.—In the United States Army, in large encampments of a more or less permanent nature, the Darnall filter is used. This consists of a series of containers, holding in all 20 gallons. There is siphon action, whereby the water is treated with alum and sodium carbonate (1 lb. per 500 gals.). Most of the suspended matter and a large percentage of bacteria are thus precipitated, and the water is filtered through flannelette bags. The apparatus is heavy and cumbersome, and what purification there is, is mechanical only.

Where the ground is at all adapted to filtration, the British have evolved rather elaborate means of collecting water by building a revetment parallel to a side hill contour, siphoning the water into this from a nearby stream, and filtering it. The filtered water may then be delivered under some head. See Figure 10.

The British also advocate the use of the self-washing filter cone, such as is used at Toronto. Theoretically it is most economical but no results from its use in the army are given, and it has not been satisfactory at Toronto.

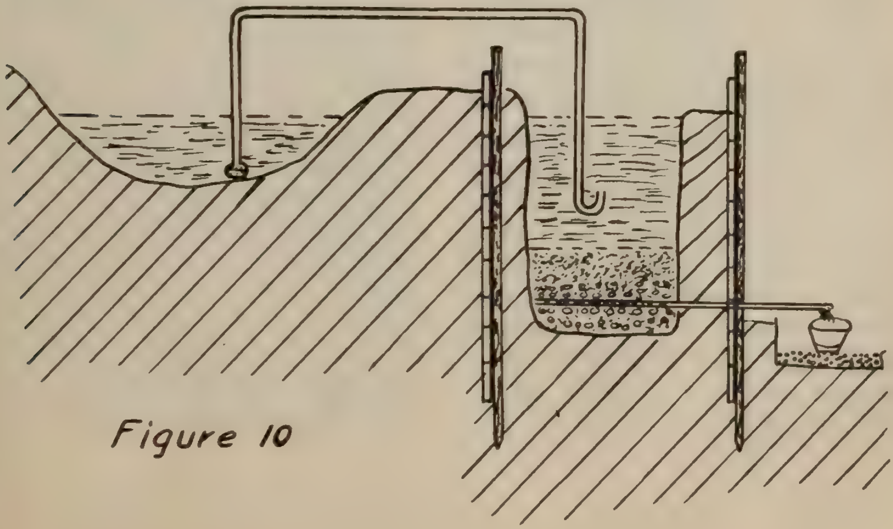


Figure 10

The British and French both use "filter candles" of porcelain or prepared material. The use is limited and results are not altogether satisfactory.

Chemical Sterilization.—When all is said and all the various suggested methods of water purification have been tried, sterilization by means of chemicals has been found most satisfactory. Of all the possible chemicals which have been used bleaching powder, or hypo-chlorite of lime has been found the most desirable, and the other chemicals largely discarded in its favor.

Hypochlorite of Lime.—To insure adequate sterilization there should be one part of available chlorine per million parts of water. To allow for probable deterioration of commercial bleaching powder, a safe amount to use is 2 grams per 110 gallons. (The British water cart holds 110 gallons.) Standard practice is to use 30 grains per 100 gallons or 8¼ pounds per million gallons. Convenient factors are that one gram = 15.43 grains, that one gallon = 70,000 grains, and that one thousand grams = 2.2 pounds.

[*B*] To determine roughly the amount of available chlorine in bleaching powder, proceed as follows:

(1) Make a thin paste from ten grains of bleaching powder and distilled water.

(2) Add one gram of potassium iodide freshly prepared.

(1) Oxidizing action. Use of a powder the base of which is permanganate of potash. Use .5 grains for 2 litres. Allow the treated water to stand 30 minutes. It should have a faint rose color.

(2) Reducing action. Accomplished by the use of a reducing agent, the active principle of which is hyposulphite of sodium. The same volume as of the oxidizing agent is used. On stirring the color becomes yellowish brown. This finally turns black and there is a precipitation of manganese dioxide with consequent clarification. The clarified water is then filtered through the Garret filter, the operation of which is evident from Figure 11.

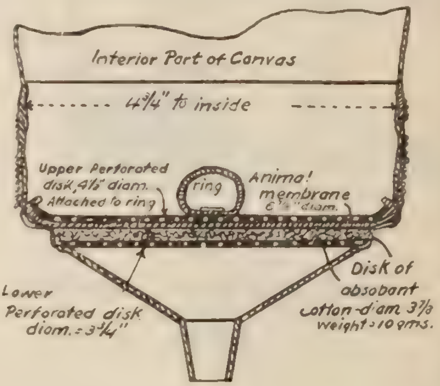

Interior Part of Canvas
4¾" to inside
Upper Perforated disk, 4½" diam. Attached to ring
ring
Animal membrane
diam.
Disk of absobant cotton-diam 3⅞ weight = 10 gms.
Lower Perforated disk diam. = 3¾"

Figure 11

Constant care to clean and sterilize the cotton filter is necessary. Otherwise the bacteria grow there and the treated water may be worse than the raw water. Used with care the apparatus is said to give excellent results, especially where both turbid and impure waters have to be handled.

The English do not advise the use of permanganate of potash alone, stating that its effect upon other than cholera organisms is uncertain, and that in addition it leaves color and taste. They do not mention its use in connection with sodium hyposulphite.

The English tendency is to use alum

for clarification, and hypochlorite for subsequent sterilization, and in this they probably accord with American opinion. It is necessary to point out that English alum is potash alum of formula

$$\begin{array}{l}Al_2(SO_4)_3+K_2SO_4+24\ H_2O\\ \quad 343 \quad + 174 + \quad 432 \quad = 949\end{array}$$

molecular weight, whereas American water supply alum lacks the potash. Using potash alum 5 grains of alum and 1½ grains of sodium carbonate are the amounts needed for a gallon of water—roughly a heaped tablespoonful of alum per 100 gallons and one-third as much sodium bicarbonate. The Darnall filter, mentioned above as in general use by the United States of America, utilizes similar methods.

To provide a simple, light, efficient apparatus for water purification and one easily erected, the Lister bag has been devised by the United States Army. This is a heavy canvas bag, supported on a tripod. Five spigots are set in the bottom with their ends projecting about three inches above the bottom of the bag. Five soldiers at a time can thus use the bag. The bag is suspended and filled with water, which should be clear. To the water is added in the form of a paste 1 grain of calcium hypochlorite. The chemical comes in glass tubes containing 1 gram each. The bag holds 40 gallons of water. The disadvantage of the bag is that while it sterilizes it does not clarify. The ideal arrangement is said to be the Darnall filter used in conjunction with the Lister bag.

[*B*] *Sodium Bisulphate.*—This salt provides a most useful means of sterilizing water by the use of a single tablet, and is in considerable use by the British. It affords a valuable means of sterilizing water for troops—as cavalry, which occasionally find themselves detached from their water carts. Each cavalry man should carry a bottle of tablets, and when refilling his water bottle he should add a couple of tablets and abstain from drinking for a half hour. Addition of 2 grams of the salt to the contents of an (English) water bottle gives .07 per cent. free H_2SO_4 which destroys bacteria in one half hour. The tablets are made up with oil of lemon and saccharin so that the solution tastes like lemonade. The objection is the liability to formation of soluble sulphate of toxic metals from water bottles. Nearly all alloys and metals are attacked. Aluminum water bottles should be supplied to all men using these tablets as the aluminum sulphate formed is so slight as to be of no consequence.

Chlorine Gas.—The use of liquid chlorine and the production therefrom of chlorine gas has come to have a widespread and satisfactory use in the United States. It seems probable that this method of sterilization will supplant older methods for permanent or semi-permanent encampments, at least in this country.

SUGGESTIONS CONCERNING THE PREVENTION AND CURE OF ACUTE LOBAR PNEUMONIA.

RUFUS COLE, M. D.,
From the Hospital of the Rockefeller Institute for Medical Research, New York.

Abstract of remarks made before the Conference of State and Provincial Boards of Health, at Washington, D. C., May 2, 1917.

IT IS unnecessary for me to tell you, who are entrusted with the health of this country, of the importance of this disease. You know the statistics better than I do. However, I should like to lay stress on one fact. By the public at large pneumonia is considered to be a disease affecting mainly the very young and the old and decrepit. As a matter of fact, over half the cases occur between the ages of 20 and 50, during the period of greatest activity. It is therefore of great economic importance, and is undoubtedly from every standpoint the most important acute infectious disease with which we have to deal.

What we all desire is to lessen its incidence and cause the number of deaths to be decreased. Can the results of the newer studies aid us in accomplishing either of these objects? A very brief review of some late observations and conceptions may be of interest from this point of view.

Probably the most important fact that has been established is that the pneumococci causing this disease are not all identical and that on the basis of their immunological differences, and to a less extent on their morphological characters, they may be divided into several groups or types. Pneumococci of Types I and II cause about 65 per cent. of the cases of pneumonia. The organisms of each of these types are immunologically quite distinct and have definite specific characters. In Type III are included the organisms which have very large capsules, form sticky exudates in animals, and are called Pneumococcus mucosus. These organisms also possess specific immunological properties. They cause pneumonia relatively infrequently, only about 10 per cent. of the cases being associated with pneumococci of this type. The remaining cases of pneumonia, about 25 per cent., are due to the organisms which have been included in Group IV. Each strain of pneumococcus of this type seems to be immunologically distinct, at least the different races possess no well-marked common immunological properties. The severity of the infection due to the organism of these various types seems to differ; at any rate, from the experience so far obtained, the mortality among the cases due to organisms of the first two groups is 25 to 35 per cent., that of the cases due to the pneumococci of the third group is much higher, 50 per cent. or more, while the cases due to organisms of the fourth group have a low mortality, 10 to 15 per cent.

Further study has indicated that

most of the pneumococci found in mouths during health belong in Group IV. Studies have now been made by Dr. Stillman and other workers in the Hospital of the Rockefeller Institute concerning the organisms isolated from the mouths of 942 normal individuals. From 450 of these individuals, 47 per cent. pneumococci were isolated. In 345 of these instances the pneumococci found belonged in Group IV or were of the so-called atypical varieties, while in only 56 instances were the organisms of Type I or Type II. Moreover, in all but three of these cases in which pneumococci of these latter types were found, there was discovered a close association between the person harboring them and a person sick with pneumonia due to the same type of organism. In this series special attention was given to the cultivation of organisms from the mouths of contacts so that it is possible that the relative number of persons found carrying these types is much larger than would be found in a series not so chosen. Efforts have also been made to discover for how long a time convalescent or healthy carriers of the types I and II pneumococci harbor these organisms. It has been found that in most cases pneumococci of these types disappear from the mouths of convalescents within a few weeks after the patients leave the hospital, though in a few instances they have persisted for a longer time, the longest time so far observed before disappearance being 83 days. Practically the same facts apply to the persistence of these types of pneumococci in the mouths of healthy carriers.

Attention also has been given to the cultivation of pneumococci from the dust of houses where patients with pneumonia were present or had been present, and also dust from houses where there had been no known cases of pneumonia. One hundred and seventy-five specimens of dust from houses where there had been present cases of pneumonia due to Type I or Type II pneumococci were studied. In 73 of these specimens of dust pneumococci were found, and in 47 instances these were of Type I or Type II, and in all these cases but two, the type of pneumococcus found in the dust corresponded in type with that isolated from the patient. On the other hand, in 62 specimens of dust obtained from houses in which no cases of pneumonia were known to exist, pneumococci were isolated 18 times, but in only one instance were pneumococci of the fixed types, I or II, present, and in this one instance a known carrier of the corresponding fixed type was found to be visiting at the time. Moreover, in two small epidemics which Doctor Stillman has had an opportunity of investigating, there was good evidence that a fixed type organism was responsible for the cases, carriers of the same type of organism were found, and the same type of organism was found in the dust.

All this evidence seems to suggest very strongly that the epidemiological factors concerned in pneumococcus infections with these fixed types I and II are the same in principle, though differing in degree, from those concerned in other infectious diseases. In other words, it seems probable that, so far as infections with these fixed types are concerned, infection from one case to another occurs either fairly directly or through the intermediation of healthy carriers. These healthy carriers, while probably larger in number than occur in other infectious diseases, are not extremely numerous, and moreover, as we have shown, are only temporarily carriers of these organisms. So far as infections with Group IV organisms are concerned, we have no evidence as yet to prove that infection may not be due to the same organism commonly carried in the normal mouth. In this form, the infection may be truly autogenous, as was formerly thought to be the case with all forms of pneumococcus infection.

The weak point in our views regarding infection with Type I and Type II pneumococci is afforded by the confusing results of the observations regarding Type III infections. Here we are dealing with the most severe type of pneumonia, though it occurs only relatively infrequently. Nevertheless among the 450 healthy carriers of pneumococci, pneumococci of this type were found 85 times, and in practically none of these persons could any association with cases of pneumonia due to the same type of organism be discovered. Moreover, it has been found that these healthy persons may carry such pneumococci for very long periods of time, even years. Also, so far as we have as yet been able to discover, these Type III pneumococci found in normal mouths differ in no way, immunological or otherwise, from those found in disease.

These facts render the whole matter still somewhat confusing, but it seems, nevertheless, that the facts found concerning Type I and Type II infection strongly suggest contagion and are sufficient to justify the introduction of some measures of isolation.

Preventive inoculation.—It does not seem that at present, in civil life at least, the method of preventive inoculation would offer a practical prophylactic measure. This measure has been carried out in native mine workers in South Africa to a considerable extent, not, however, with proper attention to prevailing types of infecting organism. The results have been very inconclusive. Lister, however, has again taken up the matter, studying the types of organism concerned and has found that the predominating type of pneumococcus found in cases of pneumonia occurring in South Africa differs from those found here, although the types prevailing here are also found there. He has made studies on himself and on a limited number of individuals concerning preventive inoculation, using the specific type organisms and has brought forward strong evidence to indicate that properly carried out preventive inoculation may be effective in preventing the occurrence of the disease due to the type of organism used for inoculation. It seems possible, therefore, that where very large numbers of cases occur among groups of individuals as in South Africa, or among troops, preventive inoculation might be tried with considerable hope of success. As before stated, however, it does not seem practical at present among ordinary civilian populations.

Serum treatment.—Lastly, is specific serum treatment of value in preventing the high mortality from this disease? For the past six years we have been carrying on studies dealing with this problem in the Hospital of the Rockefeller Institute. Since specific immunological differences of type have been shown to exist, we can only hope to obtain results from the use of serum, the action of which is known to be highly specific, when we employ in the individual case a serum which is effective against the specific type of organism causing the infection. In order to carry out this form of treatment, therefore, it was first necessary to devise a diagnostic method for determining in every individual case the type of organism causing the infection. This has now been done, using the patient's sputum for this purpose, and obtaining the organism in fairly pure condition by injecting some of the sputum into the peritoneal cavity of a mouse. I cannot go into the details of this method, here, but it is sufficient to say that while complicated, it is still sufficiently simple to be carried out as a routine measure in any well equipped laboratory. Recent studies have shown that in about a third of the cases an exceedingly simple urine test is sufficient for diagnosis. In the remaining cases, however, this method at present gives no information. Having in our possession a diagnostic method, it has now been possible to test the serum treatment in a considerable number of cases. A serum of very high protective power when tested experimentally in animals has now been obtained against pneumococci of Type I. It has so far only been possible to obtain a serum of considerably less power against organisms of Type II, and a serum having only very slight protective power against organisms of Type III has been prepared. Manifestly it is impossible to prepare a serum against all the pneumococci of Group IV. Owing to its slight protective action, it has not been thought justifiable to try the Type III serum in the treatment of human patients. Some trial has been made of Type II serum, but the results have not been very striking and further studies are being made in the hope of improving its quality. On the other hand, the clinical results from the use of Type I serum have been most satisfactory and very encouraging. Since cases of this type constitute one third of all cases of pneumonia, it would seem that favorable results obtained in this one type would justify its general employment in an effort to lower the mortality, and it would seem that the practical use of this form of therapy at present should be confined to this one type. In the Hospital of the Rockefeller Institute, 103 cases of this type have now been treated with but 8 deaths. Among the 33 cases treated during the present winter but 1 patient has died. The serum has also been used in a limited number of patients at the Peter Bent Brigham Hospital at Boston and the Presbyterian Hospital, New York, with very encouraging results, and it has been used in a considerable number of soldiers on the Texas border, with very great success.

Routine determinations of type of

infecting organism are now being made in a large number of hospitals, and the New York City and State Health departments are now prepared to determine the type of pneumococcus present in specimens of sputum sent to them for examination. These health departments and the Philadelphia City Health Department are also now manufacturing serum for distribution in their various localities.

Practical measures to be instituted by health departments.—I realize that it is somewhat presumptuous in me and that I am somewhat overstepping my proper field when I venture to suggest the practical measures which may be undertaken with some promise of success. However, I have already seen some of the difficulties and some of the pitfalls which have lain in the way of misdirected efforts, and I therefore venture to offer a few suggestions.

First, it would seem that a very important preliminary step in prevention is to make the disease reportable. The importance of this measure has been so well demonstrated as regards other infectious diseases, especially tuberculosis, that I need do no more than mention it here.

Second, it seems that we have sufficient evidence concerning the direct transference of infection in the cases due to the fixed type organisms to justify recommendations as to limited isolation of patients, sterilization of sputum, etc., and thorough cleaning of rooms in which pneumonia patients have been present, at least with soap and water. It would seem to be a proper function of health departments to extend and develop the observations which have been made regarding mode of infection. At least epidemics should be studied, and any cases of apparent direct transfer be investigated. Proper laboratory organization is necessary to do this, and I therefore suggest,

Third, that the department laboratory should be so organized or extended that determination of type of pneumococci can be accurately and rapidly made. Such determination will be of great statistical value, and where it can be done on a considerable scale for physicians, I believe it will stimulate them very much in the care and proper observation of their patients as well as be of great value in prognosis. The extent to which this work is developed will have to depend on local conditions. It is important, I believe, to limit this work at first.

Fourth, and finally, after these steps have been well organized, and only then, the health department may take up the matter of treatment of cases of Type I with an appropriate serum. When this is undertaken it is of very great importance that the laboratory be so organized that as little time as possible elapse between the collection of the sputum and the administration of serum. The earlier in the disease any form of serum therapy is instituted, the better, and this is especially true of this form of serum treatment. If sputum be sent by mail, probably remaining in the office 12 to 24 hours before reaching the laboratory, then if, arriving late in the afternoon, another 12 hours elapse before the mouse is injected, and finally the diagnosis is sent by mail, and 12 to 24 hours again elapse before the reply is received by the physician, either the patient will be well or dead before the diagnosis is obtained, or he will be so badly infected that no amount of serum will save him.

Another important point, at first at least, is that the administration of serum be made under the personal direction of a physician from the health department, who is especially trained for the work and has full knowledge concerning serum reactions. Only by this method can results be obtained which will be of value in making up your minds as to the value of the serum. I realize that all this makes the method complicated. It is complicated, but unless it can be carried out so as to obtain results, a health department is not justified in undertaking the work. Otherwise the money used will only be wasted.

Whether a health department shall undertake the manufacture of the serum used must rest largely on its policy in regard to the manufacture of other sera. Large amounts of serum are necessary. The average amount of serum per case, in our experience has been 250 cc. Horses cannot be bled so frequently as in the manufacture of diphtheria antitoxin or even in the manufacture of anti-meningococcus serum. Its manufacture is therefore expensive. If a department does not manufacture its own serum, however, but purchases from a commercial house, very great care must be taken that the serum obtained be of high potency. At present there is no established standard, but a satisfactory method of standardization has been worked out and steps have already been undertaken by Doctor McCoy, Director of the Hygienic Laboratory, toward officially establishing such a standard. When this is done the matter will be greatly simplified.

In conclusion I wish to thank you for your very kind attention and to express my appreciation of the interest you have shown in this matter. I realize that only a beginning has been made in this very important matter of preventing the great loss due to pneumonia. You will have to finally decide whether the paths along which we have started will lead to practical results. If the direction we have taken is not the correct one, we look to you to set us right.

DISCUSSION.

Dr. A. J. McLaughlin, *Massachusetts.* Mr. President, I feel sure that the Conference is under great obligation to Doctor Cole for the presentation this morning of this subject in such a practical manner, and for showing us the practical things we can do now, and as I said yesterday, we are practically following out what he has suggested. The state laboratory, and possibly the branch laboratories at Springfield, Worcester, New Bedford and other large cities, within two months will be equipped to make diagnoses. It is planned to divide the state into 23 districts, in each of which there will be a competent serologist for polio work and this same man can be trained to do the necessary work on Type I pneumococcus infections.

In regard to the administration of Type I serum, Doctor Rankin made an interesting suggestion and that was that we give the serum in all cases of pneumonia first, and then for statistical purposes determine the type by laboratory methods, and subtract all cases which were not Type I. This would give an exact statistical record and also give some advantage in getting an early administration of the serum.

In Massachusetts we have, conservatively speaking, about 1,000 deaths each year due to Type I pneumonia, and if we can reduce this number, it will be a great thing. Of course it will depend upon how the serum is taken up by the physicians, but I think as Doctor Cole does, that it should be handled carefully through competent men.

Dr. E. R. Kelley, *Massachusetts.* I would like to have your opinion as to how many diagnoses a trained laboratory assistant ought to be able to make in a day. That is a very practical question from the administrative side. There is another point, too. I wish Doctor Cole would dilate a little on the dust question. Some experiments have been made which are suggestive that we are not wrong in our view that the dust surrounding a person ill with the disease may be a source of danger for a considerable length of time.

Dr. J. T. Swarts, *Rhode Island.* What about the standardizing of the state and commercial sera?

A Member. Is fumigation advised after pneumonia, and if so, what form?

Dr. Cole: First, in regard to the question as to the use of serum from different places. We have tested out the commercial serum and that prepared by state laboratories. We have been in touch with the state laboratories for the last few years, and they have obtained the methods from us and those sera are now all satisfactory.

Certain commercial sera, though, are not of any use at all. Upon testing them, we found they had no antibodies for any type. I have already taken this matter up with Doctor McCoy, of the Public Health Service, and he is very much interested in it. The method most advisable is that we have a standard for this serum just as we have for antitoxin. I think under his direction this is going to work out most satisfactorily, and before long we will have a definite standard for anti-pneumococcic serum Type I.

If any of you take up the work immediately of manufacturing the serum, you should standardize it for yourself and make sure it is of value. Otherwise we will have very conflicting results.

As to fumigation, that is a matter for the health officials. We feel that a thorough washing with soap and water is very much more efficacious.

As to the number of diagnoses which any one person can make, that would depend upon how well the work is organized. We have carried the work out in a hospital where we have not tried to rush the matter through or make a great number of diagnoses.

As to the use of the serum in all cases. Personally I am very anxious to have treatment only in the cases which are due to the specific organism against which our serum is effective. That is the only way you can carry the treatment out with confidence and enthusiasm. If we feel that in three-quarters of the cases the administration of the serum will have no effect, we cannot have much enthusiasm about it. That is an important matter.

As to the persistence of the organism in dust, I cannot say. Enough observations have not been made. In one case the organism was found in the dust of a room occupied by a patient fifty-seven days after recovery, but in most cases these type organisms disappear from the dust within three or four weeks, sometimes within a few days.

Dr. Kelley: The reason I asked about the number of diagnoses a person could make in one day was that I heard an opinion expressed that the utmost a laboratory worker could do would be five or six a day.

Dr. Cole: I think twenty-five a day would be a reasonable estimate. If the laboratory were well-organized, he might do more.

On motion of Dr. T. D. Tuttle, a rising vote of thanks was extended to Doctor Cole.

ALCOHOL—A PUBLIC HEALTH PROBLEM.

HAVEN EMERSON, M. D.,
Commissioner of Health, New York, N. Y.

Presented before the General Sessions of the American Public Health Association, Cincinnati, Ohio, October 24, 1916.

A NOTABLE address before the convention of Public Health Officials and the Massachusetts Association of Boards of Health, on April 29, 1915, by Dr. Charles W. Eliot included the following statements:

"The next evil which should be attacked with the utmost vigor by all boards of health is alcoholism. Public opinion needs to be enlightened on two points with regard to the use of alcohol as a beverage.

"In the first place, it should be brought home to the entire population that the habitual use of alcoholic beverages reduces, in a serious degree, the productive efficiency of the community.

"In the second place, recent experiments on the effects of alcohol on the nerves and glands of the human body have demonstrated beyond a doubt that alcohol invariably does harm, and never any good either in health or disease. The use of alcohol as a defense against exposure or fatigue has been given up by all sensible persons. . . .

"This evil is rooted, first, in what are called vested interests—that is, in the investment of large amounts of capital in the plants which produce, store, and distribute beers, wines, and spirits, and secondly, in the methods of taxation to which the white nations are accustomed. Heretofore the medical profession and the public health officers have given an uncertain sound concerning the use of alcohol. . . .

"It remains for the boards of health to attack this hideous evil with the weapons and in the spirit of preventive medicine. They should bring to the work all recent knowledge concerning the effects of alcohol on the human body, call to their aid legislators who can find equivalents for the public revenue now derived from the manufacture and sale of alcoholic drinks, and reënforce to the utmost the wise counsellors who by moral teachings have brought about during the past fifty years considerable improvements in regard to the use of alcohol in the more intelligent and conscientious classes. . . .

"The responsibility of physicians and boards of health in regard to the advice they give to young people on these matters is heavy indeed; and so is their responsibility on these subjects towards legislatures, municipal governments, courts, and state executives."

Let us, for the moment, roughly group the diseases which are at present recognized as preventable, under the following three headings:

Communicable diseases.
Diseases of occupation.
Diseases due to personal habits detrimental to health.

Does alcohol as generally used in beverages increase the incidence or severity of any one or more of these three classes of preventable diseases and deaths? If so, its use is a matter of concern to public health officers.

Alcohol causes a lowered resistance to communicable diseases, to infections, and in addition to the clinical experience generally accepted, there are certain facts which add specific evidence to the general proposition. Clinical experience is unanimous on these points, but clinical experience has not been acquired or written up in a manner to be a convincing argument for those who consider that alcohol is a detriment to the public health. It is, therefore, necessary for us to search among the laboratory evidences and the special studies, and some of them I would suggest for your consideration and use in your educational work.

Conradi* showed that there was a diminished production of antibodies in cholera, in people using alcohol freely, after a dose of protective inoculation had been given. In other words, in a given group in the community, you can accomplish a very substantial protection against cholera by protective inoculation; but if the people in the presence of and following the protective vaccination, continue the use of alcohol, they lose the benefit of antibody production which your procedure has stimulated or should stimulate in their bodies.

Laitinen† showed a diminished resistance to infection in animals after dosing with alcohol.

Pampoukis and Szeckley‡ found unfavorable results and a persistence of the virus of rabies in subjects under anti-rabic treatment if they are users of alcohol. This study extended over twenty-five years of administration of Pasteur treatment at Budapest.

Reich§ noted unmistakable lowering of body resistance to disease, indicated by a less effective phagocytosis in typhoid in man and less resistance of human red blood cells to hypotonic salt solutions in proportion to the use of alcohol. These are two valuable methods of measuring cellular resistance to disease and response to infection.

In addition to the specific lowering of resistance to infection and lowered ability to combat infection when once acquired, alcohol plays an undoubted contributing part in the acquisition and spread of venereal diseases.

As Fisher and Fisk‖ have clearly indicated and as has been proved in countless tests of physical prowess and skill under almost unlimited variation of conditions, efficiency of mind and body are decreased by the use of alcohol, or as Quensel¶ so tersely put it, "Work and alcohol do not belong together, especially when work demands wide-awakeness, attention, exactness and endurance." While such statements are easy to make, it has only been within the last two or three years that we have had exact data to prove those precise general conclusions.

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* Conradi, Jour. Am. Med. Assn., April 8, 1916, p. 1122.

† Laitinen, *Ibid.*

‡ Pampoukis and Szeckley, *Ibid.*

§ Reich, Jour. Am. Med. Assn., Mar. 25, 1916, p. 962.

‖ Fisher and Fisk, *Ibid.*

¶ Quensel, *Ibid.*

Benedict and Dodge* in their classical monograph on the psychological effects of alcohol, came to the following conclusion:

"In conjunction with pulse acceleration, the general neuro-muscular depression following the use of small amounts of alcohol may be regarded as presumptive evidence of the effect of alcohol on organic efficiency. In none of our data is there any indication of a pure facilitation effect of alcohol."

In addition to these general conclusions, these authors reached in their exact studies of the time reactions of various reflexes in people treated with small amounts of alcohol, a precise foundation for the common knowledge that alcohol increases liability to accident. To the casual observer it is apparent that this increased liability to accident is due to *delayed perception* of signs occurring in the immediate vicinity of the individual (which would, to an alert and sensitive person, indicate a warning) *followed by delayed response and decrease* in the *velocity* and *amplitude* of the necessary muscular movements which must be carried out to avoid injury.

They found that there was a delay of 10 per cent. in the patellar reflex and a diminution of 46 per cent. in those dosed with small amounts of alcohol. Similarly they discovered a 10 per cent. diminution in the lid reflex, 5 per cent. in the eye reflex, 3 per cent. in the speech reflex, 14 per cent. diminution to faradic stimulation, 9 per cent. diminution in the finger movements and 11 per cent. decrease in the velocity of the eye movements. Just note what that series of observations means. Remember that an accident occurs or is missed according to the rapidity, quality and amplitude of the neuro-muscular response. The saw, the lathe, the swinging beam of steel does or does not mutilate the careless workman, according to the reaction of a thousandth of a second upon which the self-protective mechanism depends. We used to say, explaining an accident, "The man was dull with his beer"; now we know the measure of his dullness, that the slight dose of alcoholic beverage will, with certainty, delay his response of eye, voice and hand, and he suffers accordingly.

It is not strange, therefore, that careful students observing large numbers of dispensary patients reach the conclusions which Brickley† reached at the Haymarket Relief Station in Boston, where 40,000 patients a year pass through the hands of physicians and surgeons.

Brickley summarizes the results of his studies as follows:

That alcohol causes accidents.

Obscures the diagnosis.

Increases the danger of infection at the time of accident.

Prevents adequate treatment.

Increases the danger of intercurrent complications.

Retards the process of repair.

Gives poorer end results.

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* Benedict and Dodge, Jour. Am. Med. Assn., Mar. 25, 1916, p. 962.

† Brickley, Boston M. and [illegible] ur., Ma 20, 1916, p. 744.

Increases the mortality from accidents.

Increased susceptibility to specific metallic poisons occurring in volatile form or distributed by hand to mouth contact, has been demonstrated in the lead, phosphorus and aniline industries, and it is a general statement capable of exact support that where there are unfavorable industrial conditions putting a strain upon the individual worker, those who are accustomed to using alcohol steadily and not even in obviously intoxicating amounts, show a greater susceptibility to the unfavorable conditions of their environment than do those who abstain from the use of alcohol. The non-alcoholized individual comes out of his risks without the clinical manifestations of the poisoning more often than does his fellow workman who uses beer and whiskey.

Glaister* has recently reported an increase in the susceptibility to mountain sickness, shown by those mountain climbers who use alcohol in small amounts.

Ashby† in his 1915 edition concludes that there is an increase among stillbirths and an increase in the death-rate of children born alive, maintaining an almost constant relation to alcoholism in the mother. This clinical observation of the physician and public health administrator is well supported by the studies of Stockard,‡ under experimental laboratory conditions, where he was able to observe the constant degenerative results in guinea pigs, rabbits, etc., and to analyze the damaging effects of alcohol, where applied through one or both parents, and as it affected the immediate progeny and the later litters of young. Wiggelsworth§ expresses the common opinion that alcohol causes an unstable and badly developed brain and nervous system. By this we mean that the use of alcohol in the parent usually or frequently determines an unstable and badly developed brain and nervous system in the progeny, not necessarily giving us a characteristic case of what would be called an inherited or congenital disease due to alcohol, but a resultant diminished constitutional resistance in the presence of the stresses and strains of our present social order.

It is necessary only to remind this audience of the report of Hunter, based upon the records of the insurance companies here and abroad, which indicates that mortality among users of alcohol is in almost direct proportion to the amount of alcohol consumed and that financial policies and actuarial practice recognize the relationship between the use of alcohol and life insurance risks.

Without entering the field of economics or discussing the distinction between luxuries and necessities, it is easy to see that the food materials which enter into the production of alcoholic beverages lose so much food value and the amount invested in the industry is so large a tax upon the community as a whole, for the sake of producing and distributing this habit-forming drug, that the general cost of living of a country, and one might properly say of the world at large, is considerably raised by the demand for alcoholic beverages. That, perhaps, is not one of the burdens of the public health officers, but it has a decided bearing upon the economic status of the people who must depend upon their economic efficiency to meet the competition of life.

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* Glaister, Journ. Am. Med. Assn., July 2, 1916, p. 308.

† Ashby, Infant Mortality, Cambridge Public Health Series, 1915.

‡ Stockard, Proc. Soc. Exp. Biol. & Med. N. Y. 1913–4, xi, 136.

§ Wiggelsworth, Infant Mortality, Cambridge Public Health Series, 1915.

We, the public health officers of this country, must overcome the inertia of this habit in the community and offset the momentum of great industries by teaching the consumer and the producer of alcoholic beverages to discontinue their mutual conspiracy, which is robbing the future generations of their birthright of health.

What are you, as public health officers, and your staff doing now by personal example and by teaching through the spoken and written word to wean your community from a habit which is a large contributory factor in the cause of the deaths and sicknesses for the prevention of which the community employs you and trusts to your advice? I would not have it appear for a moment that I am asking you to start a campaign for legislative interference with the production of a widely used commodity; I am asking you simply to so teach the consumer, so that he will cease to demand the product. Automatically capital will flow into other sources and the momentum of the industry will be checked. We must teach the consumer not to use liquor, and I believe the public is learning the lesson. I think that there is no power in the country so great as the power of the public health officers if they speak and write to this effect in no uncertain tones, unanimously and continuously.

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RESOLUTIONS ADOPTED BY THE CONFERENCE OF STATE AND TERRITORIAL HEALTH OFFICIALS AT THE SESSIONS HELD IN WASHINGTON APRIL 30—MAY 3, 1917.

We, the Executive Health Officials of the several states and territories, in conference assembled, do hereby

Resolve, That under conditions incident to a state of war, the public health personnel, resources and organizations of the several states and territories should be placed at the disposal of the Federal Government.

WHEREAS, The Federal Public Health Service has hitherto been the natural point of contact between the Federal Government and the several states and territories in all matters pertaining to public health, and the aforesaid service is thoroughly familiar with the manner of administration of public health measures by State and local boards and departments of health, be it therefore

Resolved, That it is the opinion of the Executive Health Officials of the several states and territories in conference assembled, that the Federal Public Health Service, under conditions incident to a state of war, should be the agency of the Federal Government through which correlation, supervision, and direction of the various state and local health agencies should be exercised, and be it further

Resolved, That aside from the hygienic and medical care of the actual military and naval forces, all sanitary and hygienic activities incident to a state of war which require a national policy, should be correlated, supervised, and directed by the United States Public Health Service.

WHEREAS, The present personnel and organization of the Federal Public Health service is entirely inadequate, be it therefore

Resolved, That it is the opinion of the Executive Health Officials of the several states and territories, in conference assembled, that a National Sanitary Reserve Corps should be created as an auxiliary to the Federal Public Health Service.

We, the Executive Health Officials of the several states and territories, in conference assembled, do hereby unequivocally endorse the following resolution:

JOINT RESOLUTION.

To Establish a Reserve of the Public Health Service.

Be it resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That for the purpose of securing a reserve for duty in the Public Health Service in time of national emergency, there shall be organized, under the direction of the Secretary of the Treasury, under such rules and regulations as the President shall prescribe, a Reserve of the Public Health Service. The President alone shall be authorized to appoint and commission as officers in the said reserve such citizens as, upon examination prescribed by the President, shall be found physically, mentally, and morally qualified to hold such commissions, and said commissions shall be in force for a period of five years, unless sooner terminated in the discretion of the President, but commission in said reserve shall not exempt the holder thereof from military or naval service. Said officers shall consist of Sanitarians, Passed Assistant Sanitarians, and Assistant Sanitarians: and when ordered to active duty in the service of the United States, shall receive the pay, allowances, and leaves of absence of Surgeons, Passed Assistant Surgeons, and Assistant Surgeons, respectively, provided that the Secretary of the Treasury may appoint for duty with said reserve employees in such number as the public interest may require and the funds appropriated may permit.

That for the purpose of carrying out the provisions of this act the sum of $......... be appropriated out of any money in the United States Treasury not otherwise appropriated.

Resolved, In the opinion of the executive officials of the health departments of the various states and territories, the state departments of health of the respective states and territories should assist the federal authorities in the following sanitary activities during the period of the war.

First. The sanitation of military and naval camps and camp sites.

Second. The exercise of police powers in relation to the sanitation of the environment of military and naval camps.

Third. The provision, when required, of public health laboratory facilities for the diagnosis and sanitary surveillance of infectious disease occurring among the troops.

Fourth. The provision as far as possible, when required, of hospital accommodations for the care of cases of communicable disease occurring among the troops.

Fifth. The protection of military and naval camps from the introduction of communicable diseases (including tuberculosis and venereal diseases), from the civilian population.

Sixth. The sanitation of intrastate transportation facilities.

Seventh. The investigation and exclusion from military and naval camps of disease carriers.

Eighth. The immediate reporting to the Public Health Service of epidemic foci of various infectious diseases (especially poliomyelitis, epidemic cerebrospinal meningitis, smallpox, typhus, typhoid, and paratyphoid fevers and bacillary dysentery), developing in any of the states or territories.

Ninth. The sanitary supervision of refugees and interned aliens.

Tenth. The sanitary supervision of the sources of the water, milk, and food supplies of the combatant forces.

Eleventh. The sanitary supervision of soldiers suffering from pulmonary tuberculosis, or those rejected from the army and naval forces because of this disease.

Twelfth. The sanitary supervision of migratory laborers and of industrial camps.

THE DEATH-RATE OF WASHINGTON.

W. F. Willcox,
Professor of Economics and Statistics, Cornell University, Ithaca, New York.

AT THE close of an elaborate article on "Death-rates in Old and Young States" which in the April issue of this *Journal*[*] the State Commissioner of Health of Washington reached the following conclusions:

"First. The registration of deaths in the state of Washington is as complete as that in most, if not in any, of the states in the registration area.

"Second. The low infant mortality in Pacific coast states is an absolute fact and not a hallucination of over-zealous health officers.

"Third. A mortality of less than 10.0 in a young state is entirely right and proper and when the mortality exceeds 10.0 in our young states, investigation as to the precautions taken for the preservation of the health and lives in such states is entirely in order.

"Fourth. That some method should be devised by the United States Census Bureau whereby reasonably accurate estimates of population may be made in sporadically growing states."

The first and third of these conclusions are opposed to positions which I defended in an address before the California meeting of the American Statistical Association in the summer of 1915.[†] At that time I said "The death records of Washington . . . are very imperfect and as a result cannot serve as a basis for studying the recent growth of population in the Pacific states" (p. 719) and in the course of my argument suggested that it might be wise for the Director of the Census in the exercise of the discretionary authority vested in him by Congress to exclude the state of Washington from the registration area on the ground that the inclusion of its incorrect and misleading returns with those of the more trustworthy figures from 22 other states tended to discredit the whole set of figures.

This conclusion regarding the little value of the Washington figures was merely introductory to my main argument. With a group of statists, also, I might venture to assume a knowledge of the elementary principles of vital statistics and a conviction that a death-rate of 8 per 1,000 in Washington might at once be rejected. For these reasons I did not amplify my argument. But now my conclusion has been challenged and the hearing transferred to a jury composed mainly of physicians, few of whom probably have been trained in vital statistics. If I were writing for statists I might try to undermine Doctor Tuttle's conclusions by following the intricacies of his argument and calling attention to its fallacies. But under the circumstances a shorter and simpler method seems to be better.

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[*] Dr. T. D. Tuttle, "Death-rates in Old and Young States," in *American Journal of Public Health*, Vol. VII (1917), pp. 359–377.

[†] W. F. Willcox, "Some Population Statistics of the Pacific Coast States," in *American Statistical Association Publications*, Vol. XIV (1914–15), pp. 711–726.

Let me ask first, How small a death-rate will be accepted by experts without suspicion that it is inaccurate? A trained statist would raise this question almost instinctively at the threshold of our present subject and yet in his extended discussion Doctor Tuttle makes no mention of it. He does say, however, "that a death-rate of 9.0 or less in Washington, Oregon, Utah, Montana or any other of our very young states . . . is not unreasonable" (p. 372).

When Iowa was a very young state, its annual death-rate according to the State Board of Health was 4.5.* Would Doctor Tuttle accept such a rate for the Iowa of 1885 or the Washington of 1915 as "not unreasonable?" If he would not, at what point along the scale between 4.5 and 9.0 would scepticism become reasonable and why?

In seeking an answer to this question I will consider first expert opinion and then the evidence on which that opinion stands. I begin with English expert opinion because vital statistics has had a longer and richer development in England than in any other country.

The rate of 17 per 1,000 was long regarded in England as the standard rate for an increasing population and any excess as evidence of unsanitary conditions. From Doctor Tuttle's statement that, if one of these very young states "does not hold her death-rate at or below 10.0 per thousand population she is justly entitled to condemnation for failure," I infer that he would use this rate as a standard much as the rate of 17.0 per 1,000 was long used in England.

That the tendency in England has been towards lowering the standard rate to a point much nearer the one accepted by Doctor Tuttle is shown by the fact that, while at first the rate of 17 per 1,000 was chosen as the upper limit of decennial rates in districts to be included in the Healthy Districts (areas which have long been used in that country as their nearest approach to a realization of the sanitary ideal), yet for the decade, 1881–90, this upper limit was reduced to 15 per 1,000 and for the decade 1891–1900 to 14 per 1,000. For the last decade the lowest rate in any of the 631 registration districts of England and Wales was 12.3 per 1,000.

That a rate not much below the first English standard of 17 per 1,000 was regarded twenty years ago as the lower limit of the range in American cities is indicated by the reply which I received in 1898 to a question about the reported death-rate of Buffalo in 1897. Dr. John Shaw Billings, to whom my question was addressed, was then undoubtedly the first authority on vital statistics in the United States. He wrote: "The presumption against a city of 350,000 people with a density of population of about fourteen to the acre having a death-rate even for one year of 12.4 is very great—so much so that I should feel sure that, if the city of Buffalo makes such a report, either the population has been overestimated or all the deaths have not been reported. . . . Whatever the explanation may be, the possibilities are at least 50 to 1 that the death-rate in

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* "Mortality vs. Immortality," in *American Statistical Association Publications*, Vol. II (1890-91), p. 152.

Buffalo has not been below 15 per 1,000 per annum." After the population of Buffalo in 1900 had been counted it appeared that its population in 1897, when it claimed a death-rate of 12.4, had been greatly overestimated by the city authorities; and, by correcting that estimate, the rate was raised from 12.4 to 13.8. If the number of deaths in the city of Buffalo in 1897 as reported by the New York State Department of Health be substituted for the much smaller number reported by the Buffalo Department and the corrected estimate of population be used, the city death-rate in that year is further increased to 15.5.

In connection with the American census of 1900 it was decided to accept the local returns of deaths where they existed and yielded rates intrinsically probable and, in all districts where local returns were lacking or yielded improbable rates, to ask the enumerators to inquire of each family about deaths during the previous year. Mr. King, then Chief Statistician for Mortality, asked my opinion regarding the limit to be thus fixed and I suggested 15 per 1,000. In the end that limit was adopted by the Census Office.

As the death-rates in most civilized countries have been falling for several decades, the lower limits of the range within which death-rates may be accepted as not on their face open to suspicion or rejection have likewise been falling. My own answer to the question I have stated would be this: Under present American conditions and in a normally constituted but increasing population a death-rate of below 14 may be viewed with serious question; a death-rate of below 12 is presumably incorrect, that is, it shifts the burden of proof and no statist should accept or use such a rate unless the authorities responsible for its accuracy offer convincing evidence that the sources of serious error have been considered and eliminated; a death-rate of below 10 no more deserves serious statistical analysis than does the claim also sometimes defended by statistical evidence that vaccination does not diminish the chance of contracting smallpox.

Thus far I have merely marshalled the opinions of statistical experts. But their opinions have only a preliminary value and the final answer must depend upon the evidence supporting them. So I turn to the next question, Why do experts look askance upon published death-rates below a certain limit? Let me make the question specific and apply it to the present situation. Why do experts look askance upon the published death-rate of Washington in 1910, namely 10.0 per thousand? I select the year 1910, for two reasons; first, that year had the highest death-rate recorded for Washington since it was admitted to the registration area in 1908 and consequently, if the rate in 1910 is incredible, all the others must be rejected; secondly, 1910 was the census year and by choosing that date we throw out of court Doctor Tuttle's arguments about the correctness of the Census Bureau's estimates of the population of Washington for years since 1910.

A death-rate of 10 per 1,000 means, of course, that one per cent. of the population died in the year and, if maintained through a long series of years, it means that not more than one per cent. died in each year and, consequently, that a period of one hundred years would be required before the population would be dead. This does not mean that everyone would live to be one hundred years old; but, if the population was a stationary one, so-called, that is, one which for years had been recruited only by births and reduced only by deaths in equal number, then the average duration of life in the state would be one hundred years.

But Doctor Tuttle and those who agree with him would reply that the population of Washington is not stationary. The whole argument of my paper, he would say, applies only to "young states" in which the population departs so widely from the stationary condition as to make the objection entirely inapplicable and irrelevant. This reply has force and I admit that, if it cannot be met, all that has thus far been urged goes only a short way toward undermining his conclusion. To meet his objection, the difference between a stationary population and the population of a "young state" like Washington must be measured, a step which, I believe, has not been taken in any previous discussion of probable and improbable death-rates. To make the question specific and applicable directly to the present problem, I will phrase it thus: If all the recorded rates in Washington in 1910 for each sex and each age period had remained unchanged, but if the population to which they applied, instead of being that characteristic of a young state, had been an ideal stationary one like that for which a life table speaks, what would have been the death-rate in Washington? Obviously the rate would have been higher than 10 per 1,000 and the excess above 10 would measure the influence of the peculiar sex and age composition of Washington in reducing its death-rate. The death-rates in Washington in 1910 for each sex and age period are given in columns 2 and 5 of Table I. In computing them the population and the deaths in Washington of unknown age, each between one-half and three-fourths of one per cent. of the total, have been disregarded.

On applying these rates to the population column in the life tables for white males and white females in the original registration states 1909–11,* the numbers of deaths shown in columns 3 and 6 of Table I are obtained.

This table means that, if the rates reported in the state of Washington in 1910 had been just what they were but the population, instead of having the sex and age composition characteristic of a "young state," had been "stationary," or of the sort that would result from no immigration, no emigration and equal and uniform numbers of births and deaths for a generation, then the death-rate in Washington in 1910 would have been 14.25 instead of 10.0. In other words,

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* Bureau of the Census, *U. S. Life Tables*, 1910 (Gov't Printing Office, 1916), pp. 22–25. I have reduced the population in those two tables to a standard million of the two sexes.

TABLE I.

ESTIMATED DEATH-RATE IN WASHINGTON UNDER ASSUMPTION OF A STATIONARY POPULATION, 1910.

Age.	*Male.*			*Female.*		
	1 Population.	2 Death-rate.	3 Estimated deaths.	4 Population.	5 Death-rate.	6 Estimated deaths.
Under 1	9,011	98.28	886	8,876	69.89	620
1– 4	33,411	8.37	280	33,186	7.51	249
5– 9	40,623	3.22	131	40,435	3.65	148
10–14	40,072	2.75	110	39,948	2.88	115
15–19	39,505	4.52	179	39,436	3.34	132
20–24	38,617	5.72	221	38,656	4.97	192
25–29	37,559	5.73	215	37,678	5.96	225
30–34	36,348	6.18	225	36,564	5.55	203
35–39	34,866	7.68	268	35,302	5.99	211
40–44	33,143	8.29	275	33,914	7.09	240
45–49	31,140	10.54	328	32,298	7.24	234
50–54	28,817	12.98	374	30,334	9.86	299
55–59	25,925	20.26	525	27,787	16.01	445
60–64	22,273	27.35	609	24,455	22.44	549
65–74	31,078	46.61	1,448	26,057	34.70	904
75–84	12,424	102.03	1,268	15,510	86.26	1,338
85–94	1,910	186.50	356	2,682	153.23	411
95	66	228.57	15	94	266.69	25
Total	496,788		7,713	503,212		6,540

Both Sexes: Population 1,000,000; Deaths 14,253; Death-rate 14.25.

the reported death-rate of Washington would have been about 42 per cent. higher than it was, if the population had been "stationary" and distributed to sex and age classes as in the life tables for white males and females in the registration states of 1900 for 1909–11 and if all other conditions had been unchanged.

We are now in a position to ask the question in the following words, Do experts doubt the accuracy of a death-rate of 14.25 in a "stationary" population and, if so, why?

They do doubt that accuracy and for the following reasons:

1. The average duration of human life in a "stationary" population is found by dividing 1,000 by the death-rate per 1,000. If 14.25 per 1,000 of the population die each year, it will require a period of about 70 years for the whole population to die. This does not mean that everyone born will live to be 70 years old, but it does involve the corollary that the total number of years lived beyond 70 by those who survive that age will be equal to the number of years short of 70 not lived by those who die before that age.

The greatest average duration of human life recorded in any life table with which I am acquainted is found in the table for white females in the rural part of the registration states of 1900 for the years 1909–11. That duration is 57.35 years. If the average duration of life in Washington is 70.3 years, then the length of life in that state is between one-fifth and one-fourth longer than in the healthiest region for which we have this information. That Washington is so much healthier than any other region in the world for which the facts are known will be denied by experts, because inaccuracy in the record is far more likely than so exceptional a duration of life.

2. The median duration of life is that duration at which the initial number of births is reduced by one-half. As the deaths in infancy are more numerous than in any other equally long period of life, and as these infant deaths have far more influence in lowering the average than in lowering the median duration of life, the latter is regularly several years greater than the former. Thus, in the life table for white females in the rural part of the registration states the average duration of human life was 57.35 and the median duration was 67.38. Probably the difference between the average and the median duration of human life in Washington is at least as great. If so, and if the 1910 death-rate was correct, the median duration of life in Washington is about 80 years. This would mean that of a given number of children born in that state one-half would live to and beyond 80 years of age. This again is so far outside of the range of probabilities attested by records in many countries and through long periods of time that no expert is likely to give it serious attention.

3. The death-rates in many of the counties of Washington are incredible. The deaths for a single year are often too few to give a representative rate. To avoid that objection, I have found the annual average number of deaths in each county for the period 1908–12 and compared it with the population

TABLE II.

DEATH-RATES IN COUNTIES OF WASHINGTON.

County.	Population 1910.	Average annual number of deaths 1908–12.	Death-rate.
Wahkiakum	3,285	9	2.7
Douglas and Grant	17,925	71	4.0
Cowlitz	12,561	77	6.1
Klickitat	10,180	62	6.1
Island	4,704	29	6.2
Franklin	5,153	34	6.6
Stevens and Pend Oreille	25,297	170	6.7
Pacific	12,532	85	6.8
Adams	10,920	75	6.9
Okanogan	12,887	89	6.9
Ferry	4,800	34	7.1
Skamania	2,887	21	7.3
Asotin	5,831	43	7.4
San Juan	3,603	27	7.5
Kitsap	17,647	134	7.6
Whitman	33,280	268	8.1
Chehalis	35,590	291	8.2
Lincoln	17,539	143	8.2
Benton	7,937	66	8.3
Clarke	26,115	220	8.4
Mason	5,156	44	8.5
Snohomish	59,209	511	8.6
Lewis	32,127	280	8.7
Whatcom	49,511	430	8.7
Skagit	29,241	259	8.9
Columbia	7,042	64	9.1
Thurston	17,581	162	9.2
Chelan	15,104	141	9.3
Garfield	4,199	39	9.3
Walla Walla	31,931	298	9.3
King	284,638	2,680	9.4
Jefferson	8,337	82	9.8
Clallam	6,755	71	10.5
Kittitas	18,561	195	10.5
Yakima	41,709	444	10.6
Pierce	120,812	1,351	11.2
Spokane	139,404	1,560	11.2

enumerated in 1910. The results appear in Table II in which a few counties have been combined because the boundaries between them changed within the five year period.

Before accepting any of the rates in Table II the statist will ask whether the sex and age composition of the population or the sanitary conditions of the county or both make the rate probable. But many of them are to be rejected without raising that question because the rates are so improbable as to be discarded at once.

4. The presumption against the accuracy of these registration figures is strengthened by the number and kind of errors which crept into the Federal census of Washington in 1910. At every census a few regions, usually cities, in various parts of the United States, try to bring the results of the enumeration up to their own inflated ideas on the subject, sometimes by honest mistakes, but usually by fraudulent and illegal practices. In 1910 there were 23 cities in the United States which were discovered by the Bureau of the Census to have been seriously over-counted and of these nearly half were in the state of Washington. In Tacoma, says the Director of the Census, "the frauds in the original enumeration were peculiarly flagrant and extensive."* The Federal expert in charge of the enumeration for the whole country and the best man in the United States in that field was sent out to Tacoma and made a complete reënumeration of the city. As a result the population was reduced from the reported number, 116,270, to 83,743, a loss of 32,527, or 28 per cent. In 9 other cities of Washington also the population figures were reduced. Of course it is possible that the figures for the state even after these corrections were far too large and that the error in the death-rate is due to a padding of the population count rather than to omissions in the death records. But errors in an enumeration are far easier to detect than errors in the registration of deaths and as the former source of error was carefully studied and the other almost ignored, it is probable that the main, if not the only, cause of error in the death-rate is omission of deaths.

I have recited briefly the reasons which arouse a skepticism of the reported death-rate in Washington and a belief that it has not in any year been as low as 10 per 1,000. Since that is the point I started to argue, it might be well now to stop.

But most of Doctor Tuttle's article is a criticism of the census estimates of population, for the method of which I am partly responsible. He thinks them grossly erroneous and proposes a new method. Hence a few words elucidating his last conclusion may be in place. When a method of estimating population had to be adopted the committee appointed to make recommendations on the subject sent a letter of inquiry to about 50 persons in various parts of the United States who were familiar with vital statistics. Nearly all in their replies advocated the arithmetical method of estimate and, as all members of the committee also

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*Bureau of the Census, *Annual Report of the Director* for 1909–10, p. 26.

were in favor of that method, we found no difficulty in making a unanimous report.

Any method which assumes that the population grows regularly is bound to be a misfit when applied to a population which grows irregularly, as it does in the far western states, and many estimates of population, therefore, especially for the later years of a decade, are bound to be wide of the mark. The reasons for preferring the census method to any alternative then in sight were carefully explained in a chapter of my report made in connection with the census of 1900.*

The method which Doctor Tuttle now proposes is novel and was not then before us. It rests on the assumption that there is a constant ratio between the population and the deaths from other than preventable causes and leads to the conclusion, which he points out with unconscious humor, that a serious increase in the deaths from influenza would result in a sharp increase of the estimated population. Further comment is superfluous.

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* "Methods of Estimating Population" in Census of 1900, *Supplementary Analysis*, pp. 580–594.

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SYPHILIS IN THE AUSTRIAN ARMY.

In a recent issue of the *Wiener Klinische Wochenschrift* (XXIX., No. 51), Hecht, an Austrian army surgeon, states that in his corps records are now kept of every man with venereal disease, and a certain mark opposite the name of a man on the register indicates that in no circumstances is he to be granted home leave. This restriction of home leave had previously been enforced for typhoid carriers. Hecht adds that no one seems to class the venereal diseases with infectious diseases, but he is convinced that this neglect to apply the measures that have been found reliable with other infectious diseases will avenge itself sooner or later. He estimates that the number of syphilitics in the Austrian army now must certainly be several hundreds of thousands, and complains that they are being treated in hospitals, while sound and healthy men are being shot down in their stead. This actually places a premium on sexual infection, for the healthy have no chance of a few months' respite in the hospitals from the fighting. The effect likewise is to spare the syphilitics while the sound get killed off. He makes the very reasonable suggestion that the diagnosis should be the signal for sending the man to the front. This would have a deterrent effect; at present many prefer to take their chances with syphilis rather than with the enemy's shells. Hecht thinks it might be possible to form special companies of syphilitics as soon as the ulcers have healed over, so that the treatment could be conveniently continued and applied on the firing line, while infection of other troops would be prevented. Neisser long insisted that courses of salvarsan and mercury could be given perfectly well in the trenches. Hecht declares that it is impossible to reiterate too often the frightful danger for the populace from syphilitics in the primary phase. Since the war began, a total equivalent to sixty divisions have been temporarily withdrawn from the fighting for venereal diseases. In conclusion, Hecht insists on the necessity for enlightening the public in regard to the danger of venereal disease in candidates for matrimony. —*Medical Officer, London.*

THE COMPOSITION AND RELATIVE ECONOMY OF SOME BREAD SOLD IN WASHINGTON, D. C.

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IN VIEW of the fact that the price of bread has been advanced in most cities, food and health officials and the public are especially interested in the composition and nutritive value of the staff of life as sold today. The health department of the District of Columbia was interested further to learn the relative economy of the variously priced loaves. Consequently forty-six samples of bread, representing the products of the principal bakeries of the District of Columbia, were purchased during the month of January by inspectors of the health department and analyzed in the chemical laboratory of the department.

In the analyses of these samples the following determinations were made: Weight of loaf, moisture, protein and ash. Calculations to determine the amount of bread and of solid matter which each cent spent by the pur-

TABLE I.

COMPOSITION OF BREAD.

	4c loaves.	5c loaves.	6c loaves.	10c loaves.	12c loaves.
Weight of loaf:					
Maximum	11.74 oz.	13.01 oz.	12.90 oz.	24.20 oz.	25.60 oz.
Minimum	8.78 "	9.28 "	10.19 "	20.50 "	21.00 "
Average	9.95 "	10.91 "	11.79 "	21.66 "	23.51 "
Moisture:					
Maximum	36.91%	37.60%	39.25%	38.13%	36.59%
Minimum	31.84%	30.57%	30.10%	32.93%	30.51%
Average	34.29%	33.81%	35.13%	34.70%	33.81%
Protein:					
Maximum	8.49%	8.69%	8.47%	8.695%	8.67%
Minimum	7.93%	6.82%	6.49%	7.435%	7.785%
Average	8.23%	7.82%	7.53%	7.890%	8.190%
Ash:					
Maximum	1.075%	2.41%	1.485%	1.505%	1.235%
Minimum	0.910%	0.87%	0.870%	0.705%	1.020%
Average	1.020%	1.26%	1.050%	1.040%	1.130%
Solids:					
Maximum	8.25 oz.	8.93 oz.	8.95 oz.	15.90 oz.	18.05 oz.
Minimum	5.75 "	6.44 "	6.70 "	13.57 "	13.90 "
Average	6.67 "	7.06 "	7.63 "	14.59 "	15.83 "
Number of loaves analyzed.	5	11	22	5	3

chaser can buy were also made. The reason for these calculations will appear later. The methods of analysis used were those of the Association of Official Agricultural Chemists with the exception of the method of determining moisture. For moisture the method described by Wessling* was used with satisfactory and concordant results. The results of these analyses, grouped according to the price of the loaf, is summarized in Table I.

From the data furnished in this table an approximation of the relative economy to the purchaser of the variously priced loaves was obtained in the following manner: The average weight of the loaves of each class was divided by the cost of the loaf, giving in directly comparable figures the amount of bread purchased by each cent spent by the consumer in each case. Since the solids of bread and not the moisture constitute the factors of nutritive value a similar calculation was made for bread solids. Furthermore, because of the importance and relative expensiveness of protein, the above calculations were also made for protein. The following statement shows the relative economy of the variously priced loaves.

On the basis of these analyses, therefore, the four cent loaves appear to have been by far the most economical as offering the maximum amount of nutriment for a given expenditure. The ten cent, five cent, twelve cent and six cent loaves follow in the order named. It is to be noted that the highest priced loaves (ten cent and twelve cent) were not the most economical, as we had been led to believe. It is to be noted further that the six cent loaves, which constitute the most largely sold single class in Washington, appear to be the least economical of all.

These results are surprising and it may be argued that the conditions under which the four cent loaves are produced are so insanitary as to counterbalance their greater economy. This contention is not borne out by the facts, however, for inspections of these bakeries by the Bureau of Sanitary Inspection of the Health Department show them to be in good sanitary condition.

As the price of bread in the District

TABLE II.

RELATIVE ECONOMY OF BREAD.

	4c loaves.	5c loaves.	6c loaves.	10c loaves.	12c loaves.
Weight of bread for each cent spent.............	2.49 oz.	2.18 oz.	1.97 oz.	2.16 oz.	1.96 oz.
Weight of solid matter for each cent spent	1.67 oz.	1.43 oz.	1.27 oz.	1.46 oz.	1.32 oz.
Weight of protein for each cent spent.............	0.205 oz.	0.170 oz.	0.148 oz.	0.170 oz.	0.161 oz.

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* *J. Ind. & Eng. Chem.*, 8 (1916), 1021.

of Columbia was raised about November 1, 1916, the following figures are interesting:* The average weight of the present six cent loaves is 11.79 ounces, while the average weight of thirty-six five cent loaves purchased prior to November, 1916, was 12.55 ounces. In other words a price increase of 20 per cent. was accompanied by a loaf weight decrease of 6 per cent. The average weight of the loaves now sold for five cents, 10.91 ounces, is about 13.06 per cent. less than the average weight of the loaves sold for five cents prior to November, 1916. To state it somewhat differently: Before November, 1916, every penny spent by the consumer brought him 2.51 ounces of bread, while now it brings him only 1.97 ounces in the case of the six cent loaves or 2.18 ounces in the case of the five cent loaves. The purchasing power of the penny has shrunk 21.5 per cent. and 13.1 per cent. respectively.

SUMMARY.

I. Analyses of variously priced loaves of bread sold in Washington, D. C., show the four cent loaves to be the most economical and the six cent loaves the least economical.

II. The ten cent and twelve cent loaves are not the most economical.

III. The purchasing power of the consumer's penny as regards bread has decreased 13.1 per cent. to 21.5 per cent. since November, 1916.

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* The price of bread in Washington was again raised about May 3, 1917. Four cent and five cent loaves are no longer sold. These now sell for six cents. The average weight of four such loaves was 9.42 ounces avoirdupois or 1.58 ounces, for each cent spent, a decrease in purchasing power of 36.54 per cent., based on the figures given above. The loaves formerly sold for six cents are now variously sold at eight, nine and ten cents per loaf. An eight cent loaf weighed 13.47 ounces or 1.69 ounces for each cent spent; the average weight of two nine cent loaves was 17.07 ounces or 1.90 ounces for each cent spent, while the average weight of four ten cent loaves was 14.72 ounces or 1.47 ounces for each cent spent. In the place of the former ten and twelve cent loaves, we now have fourteen and fifteen cent loaves The average weight of two fourteen cent loaves was 21.25 ounces or 1.52 ounces for each cent spent, while a fifteen cent loaf weighed 27.4 ounces or 1.83 ounces for each cent spent. A comparison of these figures with some of the data given in the body of this brief article will prove illuminating, but depressing.

◆

OUR DUTY.

The war in Europe has wrought great havoc; it has destroyed millions of lives, has maimed and crippled many men, has littered the fields with shells of destruction, dismantled cities, and crumbled into dust some of the most stately edifices, both secular and religious, ever conceived in the brain of man or reared by his hands. Civilization is not to be lost, and the upward progress of the race is not to be permanently arrested. The potent saving factor in this great catastrophe is scientific medicine. Had disease followed these great armies in like proportion as it accompanied smaller armies in the past, the better part of civilization might have been lost. But in all the belligerent countries medical science has stayed the pestilence and coped successfully with typhoid, typhus, plague, cholera and other infections which in the past often wrought greater havoc than war and determined the fate of nations. The obligation has come to us. Let us lay aside our individual interests, forget our personal desires and professional ambitions, and with one accord proceed in the execution of the duty that lies before us.—*Journal of the American Medical Association.*

Book Reviews.

The Internal Secretions. *By E. Gley (Paris), translated by Maurice Fishberg. New York: Paul B. Hoeber. 1917. Pp. 241. Price, $2.00.*

This is not a simple summary of the accepted facts regarding the endocrine organs and their functions. It is, rather, a thoughtful critique upon some of the current conceptions. As such it does not readily lend itself to a condensed review. To an American reader it seems that a good deal of important work published in English has been overlooked.

One point at least among those emphasized by Gley deserves restatement. This is his protest against the common practice of testing the physiological action of an extract and assuming that it will be identical with that of the principle secreted by an organ during life. Post-mortem extracts are sure to contain compounds which would not normally escape from the living tissue and the effects of such preparations may be entirely misleading. *Percy G. Stiles.*

Clinical and Laboratory Technic. *By H. L. McNeil, A. B., M. D. C. V. Mosby Company, St. Louis, Mo. 1916. Pp. 84. Price $1.00.*

This little book of eighty-eight pages purports to be a brief for history taking, an outline for physical examinations and a compend of the most practical tests in laboratory diagnosis. The first two topics are very briefly covered, each consisting practically of a résumé of the questions to ask or the morbid conditions to look for. They are very suggestive. In the section upon laboratory diagnosis the common tests of the urine, blood, sputum, gastric and duodenal contents, feces, spinal fluid, etc., are briefly described. We look in vain for the simplest and by many considered the most universally desirable test for albumin in urine, namely the cold nitric acid test. Equally futile is the search for the iodine test for bile. The illustration differentiating various forms of epithelial cells is in particular open to criticism. Much of the section is very commendable. In the section on hæmatology we note with surprise the omission of reference to any form of counting chamber for leucocytes except the simple and original Thoma type thus requiring several "fillings" for a single count. The antiformin method of examining sputum for bacilli tuberculosis is very clearly given.

It seems very questionable whether the average physician will ever attain the dexterity of performing Wassermann tests even with the doubtful assistance of the already prepared antigens and amboceptor of commercial firms. It would seem, therefore, unwise to devote twelve pages or about one sixth of the entire text to description of the technic. This is too much for a mere summary of the test, not enough for a complete guide to one who intends to do acceptable work from this article alone.

The book as a whole seems to be unevenly balanced, giving undue emphasis to the less important methods at the expense of some of much greater importance. It contains a brief and unusually satisfactory description of most of the common tests that a general practitioner will be called upon to make, all arranged in a compact and easily accessible manner. As such it is worthy of much commendation. It is very neat in appearance and well printed with no noted typographical errors. *H. W. Watters.*

Practical Urinalyses. *By B. G. R. Williams, M. D. C. V. Mosby Company, St. Louis, Mo. 1916. Pp. 139. Price, $1.00.*

The author has prepared a little book that is intended to give emphasis to certain points often overlooked by the average physician. It makes no pretence of replacing other existing works; on the contrary it urges its readers to consult the larger books for a better comprehension of the entire subject. Much of interest and value is contained in its one hundred and fifty pages, but as it is admittedly incomplete and offers practically nothing new, we do not see the reason for its appearance.

H. W. Watters.

Handbook of Suggestive Therapeutics, Applied Hypnotism, Psychic Science. *By Henry S. Munro. Fourth Edition, revised and enlarged. St. Louis, C. V. Mosby Co. 1917. Price, $5.00 net.*

The easy style and somewhat popular appeal of this book explain the appearance of a fourth edition. It is essentially an enthusiastic plea for the wider extension of suggestive methods in general medicine; while it cites no new facts and presents observations in the most uncritical way, it shows a therapeutic optimism which must add to its popularity. In this respect it has much in common with the works on Psychotherapy by Dubois, and Dejerine and Gauckler, but the author makes no pretension to any deep psychological analysis of the phenomena which he discusses. While in no way to be recommended as a book of reference or as a systematic exposition of the subject, the book is entertaining, shows much good common sense and should be stimulating to the general practitioner.

C. *Macfie Campbell, M. D.*

Health Department Reports and Notes.

REPORT.

Buffalo, N. Y.

The chief feature of the 1916 Report of the Department of Health of Buffalo, N. Y., is the report of the complete development and establishment of the several health centers in the city. By a health center it is understood to be a sub-station of the department of health organized for curative and preventive work in a given district, thus attempting to reach fundamental conditions and to bring the department in a closer touch with the people. Originally limited to infant welfare and dental service the function of these centers has extended to include preventive work. These centers properly established have induced the abolition of the obsolete methods for the caring of the city sick poor; the maintenance of uniform standard records with a system of interchange between the various departments and social organizations interested; the creation of a central dispensary to refer all cases to, not coming within the function of the health centers. The system as established in Buffalo is most complete, the centers, of which there are four, acting as distributors of milk and eggs, laboratory outfits, sputum napkins for the tuberculous, and the like. To quote the results of Buffalo's one year experience in this matter:

"Experience shows that the health center brings the Department of health in close relation with the people and elicits a responsive attitude. It secures the reporting of contagious diseases and lessens their spread. Morbidity and mortality are greatly influenced. Duration of sickness is lessened and restoration to health promoted by securing selective and appropriate hospital and other care for the sick and by following up cases of convalescence after institutional treatment. Pre-natal and child welfare work makes for better individuals, and hospital patronage by pregnant women is increased. Traditional prejudice and distrust of hospitals and dispensaries is offset and hospital care of contagious cases increased. The system of uniform records and interchange prevents duplication of work and imposition by the unscrupulous.

"Finally, it is demonstrated that all social service agencies, philanthropic organizations, hospitals and dispensaries, should be co-related for successful public work."

Buffalo has further advanced her service in the organization of an advisory council to the department, composed of representative physicians and laymen, all acting without compensation, and whose function it is to consider and advise on debatable conditions and innovations that may affect the community at large.

The reports of the Bureau of Vital Statistics and Bureau of Communicable Disease show an excellent reduction effected in the case of mortality and morbidity during early life, the direct result of progressive and intensive health work. Contrasted to these reduced rates, however, is the ever increasing mortality during middle age and advancing life from the so-called degenerative diseases, a fact which is causing this city's department no little concern. Typhoid fever remained at approximately the low level reached last year, there being reported only 51 deaths from this disease. It is interesting to note that this department absolves itself from all blame in connection with the 69 deaths from diphtheria, in that free antitoxin and free laboratory facilities are furnished. This stand seems justified in view of modern conditions. The Department also takes a firm stand on account of the deaths from measles, and whooping-cough, believing the deaths reported, 71 and 43 respectively, are due in the main to negligence and refusal to heed advise. The crude death-rate for this city for the reported year was 16.00 per 1,000 population; deducting for deaths of non-residents, there is obtained a death-rate of 14.76 per 1,000.

The same thoroughness is observed in this report as in the reports of the previous years, resulting in the production of a report which well demonstrates the scope of this department's endeavors in all fields. Tuberculosis and infant welfare work have proceeded with the same vigor and search for fundamental factors which no doubt accounts for the quite brilliant success Buffalo has attained in these two fields. The work of the laboratory has constantly increased in scope, until at the present time it is able to carry out research work relative to the best routine procedures to be used and like work.

It is to be noted that Buffalo still adheres to the policy of terminal fumigation. During 1916 over 2,000 houses were fumigated. In view of the experience of New York City, Providence, R. I., and other cities which have abandoned this procedure, it would seem that the expense entailed for the carrying out of fumigation, which is not inconsiderable, might be better utilized elsewhere.

The financial statement, subdivided as to functions, gives one a most adequate idea as to the relative value Buffalo attaches to the several activities of its health department. It is unfortunate that a report of this general excellence should lack an index or table of contents, the including of which would add greatly to its general usefulness.

NOTES.

Epidemiology of Bacillary Dysentery.—An investigation was made by Dr. Wilson G. Smillie of the etiology of 75 cases of bacillary dysentery occurring during the summer months in Boston. The sources of these cases are traced as follows:

Contact with acute case	21
Contact with carrier	2
Contact with house case	4
Condensed milk epidemic	15
Ice cream cones	9
Flies	6
Milk	1
Water	1
Fruit	1
Unknown	15
Total	75

The author's results disagree with those of other investigators, for he finds no close causal relation between high temperature and humidity, and the incidence of dysentery. He is more inclined to associate the disease with flies "for the disease had hardly begun before the hot weather was over, and the cases lasted well into September—long after the humid weather was past, though flies were still in abundance."

Contrary to expectation, illiterate foreign families were afflicted less than the poor class, careless and neglectful Americans, particularly the first generation families. This was ascribed to the simple fact that most foreigners nurse their babies, while American mothers often do not.

In his conclusions, the author emphasizes that bacillary dysentery is a readily communicable disease which may be readily spread by means of contact with an acute case or a carrier, by means of food (as milk, condensed milk, and ice cream), by water and by flies.

Sporadic summer dysentery of infants may be transmitted to older children or adults, but is usually milder among the latter.

Dysentery bacilli from a mild adult case may produce a rapidly fatal case among infants. The adult mild case is therefore a menace to the community.

Bacillary dysentery is rarely found in the nursing baby.

Hospital cases are not uncommon. The disease being transmissable by direct contact, no hospital has a right to admit patients with dysentery unless it can make provisions for their isolation.

The investigation is reported in the *American Journal of Diseases of Children* for May, 1917.

* * *

How a Life Insurance Company Helps in Birth Registration.—Public health officers are familiar with the use which the Metropolitan Life Insurance Company has made of its agency force in gathering statistics of sickness and of unemployment. Doctor Dublin, Statistician for the Company, has described in the March issue of the *Quarterly Publications of the American Statistical Association* another health activity of interest to health officers in which the Company's agents are engaged. This consists in the coöperation with registrars of vital statistics in the improvement of birth registration.

The company has printed for this purpose mailing cards like the following:

The Health Officer ....191.....
(date)
Dear Sir:
My baby..
(name)
was born on..191....
(month) (day)
at ....
(number) (street) (city)
Please send me your literature on how to keep my baby well.
....
(parent)

When the plan was first put into operation these cards were filled out by the parents and mailed to the local or state registrar of vital statistics whose address was printed on the reverse side. Experience showed, however, that frequently the parents did not fill out and mail the cards when they were left with them by the agents. In order to overcome this difficulty the plan has been changed and the agents are now instructed to fill the cards out themselves and bring them to the company's district office. Here they are allowed to accumulate until the end of the month when they are mailed to the registrar of vital statistics. According to this plan the company's cards reach him in bulk at about the same time the certificates come in from the local registrars in the regular way. The two sets of returns are then checked to ascertain the proportion of births not registered by attending physician or midwife.

The plan is now in active operation in Connecticut, Maryland, Oklahoma, Utah, Virginia, North Carolina, and Indiana, and is being extended to South Carolina, Montana, Washington, West Virginia and other states. Reports from Indiana indicate that from 18 to 20 per cent. of the births reported by the Metropolitan agents are found not to have been previously registered by attending physician or midwife. In Maryland and Connecticut, states in the Federal Birth Registration Area, the number of unregistered births reported has, of course, not been so large. In the last consignment of cards sent in Maryland three births were found not to have been previously registered; and the physician at fault in one of these cases was successfully prosecuted for violation of the law. In the last consignment of Connecticut cards three births were also found not to have been previously registered.

Health officers will watch with interest the results of this method of improving birth registration.

* * *

Infant Mortality in Old and Young States.—In connection with Doctor Tuttle's paper on "Death-rates in Old and Young States" a recent discussion of the differences in infant mortality in the Eastern and Western states and cities of the country is of interest. In a monograph on "*Infant Mortality—Its Relation to Social and Industrial Conditions*" published last year by the Russell Sage Foundation, H. H. Hibbs, Jr. shows that the differences in the death-rates for infants in these two sections of the country is very marked. He presents a table showing the infant death-rate per 1,000 population under one year of age for the states included in the Registration Area. The states are arranged in an ascending order according to their infant death-rates and the reader is at once struck with the fact that almost without exception the lowest rates are to be found in the Western and the highest in the Eastern states, with the North-Central or Middle-Western states in between. Thus the average infant death-rate for the 5 Western and Mountain states included was 91, for the 6 North-Central states, 108, and for the 9 New England and Middle-Atlantic states, 149.

The same thing is also shown in another table giving the infant death-rate per 1,000 population under one year of age for the 46 largest cities of Registration Area. The average infant death-rate per 1,000 population under one year of age was 115 for the 7 Western and Mountain cities included, 149 for the 14 North-Central or Middle-Western cities, 165, for the 7 Southern cities, 162 for the 9 Middle-Atlantic cities, and 181 for the 8 New England cities. Thus, whether states or cities are compared, the further West we go the lower the infant death-rates.

The writer accounts for this marked difference in infant mortality on somewhat the same grounds as Doctor Tuttle, although he lays less emphasis upon the influence of climate and more upon differences of economic and social conditions.

⁂

Sale of Skimmed Milk Legalized.—The New York legislature has recently passed an act amending the old agricultural law so that it reads as follows:

"The prohibition contained in this article against the sale of adulterated milk shall not apply to skim-milk, which is clean, pure, healthy, wholesome and unadulterated, except by skimming, if it is sold for and as skimmed milk. The prohibitions in this article against the sale of cheese made from adulterated milk or cream, shall not apply to pure skim-cheese made from milk which is clean, pure, healthy, wholesome and unadulterated, except by skimming. This act shall take effect immediately."

Thus, according to the May 12 *Weekly Bulletin* of the New York City Department of Health, the effort to legalize the sale of skimmed milk which has been made by that department since 1907, has finally culminated successfully.

The department expresses its approval of this amendment, realizing that but for its diminished fat content, skimmed milk contains all the valuable food constituents found in whole milk. While in the past this valuable article of diet has either been used by the farmer for feeding pigs, or the milk has been soured and the casein dried to be used in the manufacture of buttons, with the passage of this new law this extravagantly wasteful procedure no doubt will be eliminated.

⁂

Laboratory Organization.—A course on Laboratory Organization and Management is offered in connection with the Summer Sessio at Columbia University by Professor Thomas B. Freas and Professor W. L. Estabrooke. This course is unique in character and content. No other course of its kind is given in any other university in the world. A short extract taken from a special booklet, which may be had upon application to the Director of Summer Session or Department of Chemistry, is here given.

The course is planned to take the students' full time for six weeks. The subjects covered will be: Location, laboratory construction, ventilation, etc. of buildings; laboratory equipment, including desks, lockers, shops, gas, electricity, water, suction, liquid and compressed air, balances, etc.; buying from foreign and domestic markets, economic and scientific handling of supplies; organization of stockroom employees and their coöperation with the teaching staff; glass blowing by a professional glass blower will be a special feature; a series of trips in and about New York to manufacturing establishments, industrial and university laboratories, including trips to Boston, Washington, D. C., Niagara Falls, Buffalo, Rochester, Syracuse and Philadelphia, in which there will be opportunity to observe actual application of chemistry to needs of the country from the most modern viewpoint, and especially to the needs of university, college, and research laboratories in order to meet the demands of modern chemistry.

⁂

The Health Appropriation.—Five per cent. of the available revenues is recommended as the health appropriation of South Bend, Ind., by Carroll Fox, Surgeon of the United States Public Health Service. As the population is about 69,000, the recommended appropriation of $21,000 represents 30.5 cents per capita. Compared with appropriations in other cities possessing adequate health departments, this sum seems quite modest.

The recommendations further include a full-time health officer at $2,500; four inspectors at $900; five public health nurses at $900; diagnostic laboratory maintenance, $1,500; clerk, isolation hospital, transportation and miscellaneous, the balance of the $21,039.50.

In addition to the customary suggestions, Fox advises that the city install plumbing for those that can ill afford to pay for it, and permit payment in installments, as assessments are now paid in most cities; that the nursing work of philanthropic organizations and the schools be taken over by the Health Department; that plumbing inspection to be transferred to the building department; and that the coöperation of the police force be obtained in the investigation of nuisances.

The survey appears in *Public Health Reports* for May 25, 1917.

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Bicycles for Visiting Nurses.—Advertisements in the London *Medical Officer* seem to indicate that bicycles furnish transportation to a considerable degree for public health nurses employed by Countil Councils. A typical want ad for "health visitors," as they are called, states that "the salary will be £105 a year (about $511), together with third class traveling expenses and £5 10s. a year towards uniform; the salary to be increased by £10 after two years of satisfactory service. Health visitors are expected to provide their own bicycles for occasional use."

Health visitors must be fully trained hospital nurses.

Public Health Notes.

Tuberculosis in France.—*The Survey* for May 5, 1917, contains an address, delivered at a recent meeting of the Association of Tuberculosis Clinics in New York, by Dr. Hermann M. Biggs, Commissioner New York State Department of Health.. Doctor Biggs describes the tuberculosis situation as he has seen it in France during his recent study abroad.

Tuberculosis is playing a very large part in the sanitary history of the present war. Of the warring nations, France is suffering the most from this scourge.

Before the war, France had done practically nothing for the prevention of tuberculosis. The sanitary authorities have never taken official cognizance of the disease and notification of it is not required anywhere in France, even now. There have been no provisions for institutional care of either early or advanced cases, and but few dispensaries. At the beginning of the war there were in the whole of France only 1,000 sanatorium beds for tuberculosis, and these were in private institutions.

For the whole of France before the war the death-rate from tuberculosis was nearly twice that of New York State, and about three times that of England.

France mobilized a great army with great rapidity and without thorough physical examination of those enrolled. Many men thus enrolled rapidly developed pulmonary tuberculosis in the preliminary training camps, while still more broke down with active disease when subjected to the strains and hardships incident to life at the front.

In summing up the conditions in the French army, Doctor Biggs states, "the French troops are at all times, excepting when on the march, living under unfavorable hygienic conditions, those under which this disease is especially likely to be transmitted."

Over 150,000 of the French soldiers have already been discharged with tuberculous disease. There are at least 125,000 more cases among the French people living in the territory now occupied by the Germans. The French troops in German prison camps are suffering terribly from the ravages of this plague. It does not seem likely that the cases of tuberculosis in the civil population have decreased since the war began and this would mean another 150,000 cases. Doctor Biggs, therefore, believes that if the war were to be terminated at once, France would have altogether not far from 500,000 cases of tuberculosis to deal with.

At present about 11,000 beds for tubercular patients have been provided. There is great need for dispensaries, trained nurses and trained social service workers, and for physicians who are familiar with tuberculosis work.

The French government has in part realized the situation and is trying to meet the problem. Local initiative, however, is depended upon; and this will be lacking in many localities which seriously need immediate relief measures.

The author believes that it is not because measures for the prevention of tuberculosis are wanting or inefficient that the disease has become such a serious problem; but it is simply because the well-tried measures have not been applied, either before and since the outbreak of the war, in an efficient way.

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Water Purification in War Time.—"The water question still remains the supreme one in every military enterprise," states Capt. J. C. McWalter of the Mediterranean Expeditionary Force writing in *The Journal of State Medicine* for February, 1917.

In general, chlorination is the most satisfactory process. It is simple, it is cheap, it is safe and effectual. However, a great horror of chlorine in the water has developed among officers and troops in the English army. Captain McWalter believes this horror is partly due to the persistent use of the unappetizing adjective "chlorinated," and partly to the too generous use of chlorinated lime in many instances. He observes, "If an army order went forth deciding that it should be called "purified" rather than "chlorinated" very much of the prejudice against it would vanish. If just a little care were taken that neither too much nor too little of the chloride of lime were added—then another source of complaint would disappear."

When used for cooking purposes it is well to boil the chlorinated water for a couple of minutes, so as to drive off as much as possible of the chlorine.

*

Community Health in Pittsburgh.—The *Boston Medical and Surgical Journal* for May 10, 1917, reports progress of the health survey of the Metropolitan Life Insurance Company in Pittsburgh and environs. The general sickness rate is 16 per thousand, or one person in 63. Among employees in the iron and steel mills the sickness rate was 20 per thousand and among glass factory workers it was 19 per thousand.

The principal diseases enumerated are: Accidents and injuries, 9.7 per cent; rheumatism, 8.3 per cent.; influenza, 7.6 per cent.; pneumonia, 5.7 per cent.; colds, coryza and rhinitis, 4.3 per cent.; tuberculosis of the lungs, 4.1 per cent.; diseases of the stomach, 4.0 per cent.

In general, the findings for diseases and conditions enumerated are found to be the same for Greater Pittsburgh as for the entire state of Pennsylvania.

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Mouth Infections and Disease.—Hudnut emphasizes the infections that may result from bad teeth. Among these are arthritis, septic endocarditis, various septicemias, tuberculosis, nephritis, arteriosclerosis, pancreatitis, peptic and duodenal ulcers, some cases of appendicitis, chorea, neurasthenia, general malaise and others.

"A well advanced case of pyorrhea alveolaris with its discolored, denuded and loosened teeth, bathed in pus, is a disgusting sight. It has been estimated that in such cases, three or four drams of pus or more may be swallowed with the food."

He cites the case of a man of 45 in good health whose right arm became first painful, and gradually quite useless. By accident, he broke off the gold crown of one of his teeth, and immediately noticed a very bad taste and odor. The following morning, his arm had begun to improve, and ten days after the abscessed root was extracted, the arm was practically well.

The most important sources of mouth infection are: 1. General filthy condition of the mouth; 2. Set bridges and crowned teeth; 3. Carious and broken off teeth; 4. Impacted and partly erupted wisdom teeth; 5. Inflammation of the gums, including pyorrhea.

The article appears in the *Boston Medical and Surgical Journal* for May 17, 1917.

*

Infection of Bubbling Fountains.—That present types of bubblers may be a source of communicable disease is the conclusion of H. A. Whittaker of the Minnesota State Board of

Health. Writing in *Public Health Reports* for May 11, 1917, he describes bacteriological examinations which show that not only are the surfaces of the bubblers very commonly infected with mouth bacteria, but even the water will at times show these organisms.

Seventy-seven drinking fountains in use at the University of Minnesota were examined, representing 15 different types. All of these were constructed improperly with regard to protection from contamination by the consumer. Swabs from the bubbler surfaces showed that 80 per cent. were infected with streptococci, which it is reasonable to assume came from human mouths, since the water supply feeding the fountains does not contain this organism.

Even the water from the bubblers was infected with streptococci in 11 per cent. of the fountains.

Present types of bubblers are criticized, first, because all of them discharge the water vertically; second, because the low jet permits the lips of the consumer to touch the bubbler at the nozzle; third, because certain types having closed receptacles around the point of discharge retain the contaminated water falling back from the lips of the consumer.

Following the suggestion of Pettibone, Bogart and Clark of the University of Wisconsin, a fountain has been designed which obviates these difficulties by means of the slanting jet and suitable wire muzzles, which prevent the consumer from mouthing the nozzle of the bubbler. Trials covering several weeks proved that neither the nozzle nor the water were infected by streptococci with this apparatus.

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Protozoölogy.—F. G. Haughwout, Manila, P. I. (*Journal A. M. A.*, May 19, 1917), says that the importance of the protozoa as the causes of many serious ailments is well recognized, and with the opening up of new trade routes and the resulting conditions they are gradually establishing themselves in temperate climates in many cases. There has been no lack of literature on the subject but little has been done or said as to the exceeding importance of the teaching of zoölogy to medical students and the tendency of physicians to place the parasitic protozoa entirely apart and separate from the other members of that great phylum has undoubtedly retarded progress in our knowledge of the parasitic organisms. The protozoa exist in surroundings of great variety from roadside ditches and marshes, in decaying organic matter as well as parasitic in animals and plants. The most striking point of difference between the parasitic forms and others that lead a free life is that they have adopted as an environment the body tissues of animals and plants instead of the sea, a pond or a tuft of moss. The investigator in the subject of parasitic protozoa must have not only a broad knowledge of the entire field of medicine, but also a sound biologic training which will guide him far afield from the bedside in search of the solution of many medical and sanitary problems. The medical specialist in protozoölogy must be none the less a zoölogist and Haughwout holds that it is quite possible to make an exceedingly workable combination of the practical and the scientific in this work. Many medical men that he has met have frankly confessed to have never seen a living ameba or trypanosome. In view of the wealth of material which may be secured in the neighborhood of great cities in the United States this is unfortunate. He gives an outline of his plan of teaching, leading the students up to the parasitic amebas by a fairly comprehensive preliminary study of the nonparasitic forms of the region and climate, and finds that it is quite possible to give his undergraduate students adequate instruction along these lines in a course of sixty-eight hours and this is still further extended and amplified in the graduate courses. Only the general outline of this method is given. The main problem is the poor preliminary preparation, though this is not so serious in the undergraduate school. But a small proportion of students so trained he finds make a specialty of protozoölogy, but this in fact is not the end sought. The endeavor rather is to fit the men for more advanced medical and sanitary work or give such of them as fancy it the foundation by which they may by their own efforts become specialists in this line.

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Food Stuffs Used in Liquor Manufacture.—Of the many estimates of the food value of the material used in the manufacture of distilled spirits and fermented liquors in the United States, the following statement, issued by the

War Prohibition Committee, Boston, because f its authorativeness and conservatism seems o deserve thoughtful consideration:

According to the report of the Commissioner f Internal Revenue for the year ended June 30, 916 (page 138), there were used during that ear for the production of distilled spirits in the United States, the following materials:

Corn	32,069,542	bushels
Rye	3,116,612	"
Malt	4,480,588	"
Wheat	3,373	"
Barley	148	"
Oats	9,807	"
Other Materials	68,822	"
Molasses	152,142,232	gallons

Omitting wheat, oats, barley, and "other materials," and reducing corn, rye, malt and molasses to pounds, we get a total of 3,603,911,916 pounds of grain and molasses.

The census for 1900, Vol. 9, page 602, gives the following figures as to materials used in the manufacture of fermented liquors:

Corn	483,998,984	pounds
Malt	36,385,365	bushels
Barley	11,232,599	bushels
This amounts to a total of	2,260,266,146	pounds

These seem to be the latest positive figures available. The materials used in 1916 may be estimated as follows, though there is a possible margin of error. The production of fermented liquors for the year 1900 was 38,664,584 barrels. By 1916 it had risen to 58,633,624 barrels (see Report of Commissioner of Internal Revenue for 1916, p. 145). The production increased 51.6 per cent. Assuming an increase of at least fifty per cent. in the materials used, we get 3,390,399,219 pounds.

Combining the figures for the manufacture of fermented liquors and distilled spirits, we get a total of 6,994,311,135 pounds of grain and molasses.

This omits all minor ingredients and says nothing about the fruit and glucose used in the production of various other alcoholic beverages.

In a time of food shortage, when conservation of food-stuffs is an important public question, the seven billion pounds (7,000,000,000) of food materials which are used in these industries, form an item which is worth considering.

T. N. Carver,
Edmund E. Day,
William Z. Ripley,
Edwin T. Gay,
Professors in Department of Economics, Harvard University.

Irving Fisher,
Professor of Political Economy,
Yale University.

We have reviewed the statistics submitted in regard to the 7,000,000,000 pounds of food-stuffs used in the manufacture of malt and distilled liquors in the United States. It is probable that as much as one sixth of the total may be necessary for the production of denatured alcohol. At a low estimate of its calorific or fuel value the remaining five-sixths would supply the energy requirement of 7,000,000 men for a year.

Walter B. Cannon,
George Higginson Professor of Physiology
in Harvard University.

Percy G. Stiles,
Assistant Professor of Physiology in
Harvard University.

Irving Fisher,
Professor of Political Economy,
Yale University.

Industrial Hygiene and Sanitation.

Poisons in Explosives.—The danger from accidental explosions in munition manufacture has overshadowed the less spectacular but quite as real dangers of industrial poisoning, says Alice Hamilton, Chicago (*Journal American Medical Association*, May 19, 1917), who has studied the subject under the auspices of the United States Bureau of Labor Statistics. Shrapnel plants were omitted as the shrapnel consists of black powder with lead projectiles. In the forty-one plants examined by her there were about 30,000 persons employed and exposed. Only a minority were women and of these only forty were doing work involving serious risk. The poisons to which workers are exposed have been unfamiliar in this country but will become more familiar even after the war demand has ceased, on account of the many uses to which the products may be applied. It is almost impossible, she says, to get full accurate figures. There were only twenty-eight factories from which trustworthy data could be secured and in these she found that during the preceding year there had been only a little more than 2,500 cases of industrial poisoning with fifty-three deaths. Not all of the 2,500 were seriously poisoned. There were 111 who had nothing worse than a fulminate rash, and there were 205 cases of mild anilin poisoning, but with the exception of these the form of poisoning was always fairly serious and sometimes very much so. In the table she gives, trinitrotoluene and benzene furnish the largest proportions of fatal cases while nitroglycerin has not a single case to its credit. Nitrobenzene and trinitrotoluene proved quite dangerous, the latter being responsible for more trouble than any substance except the nitrogen oxids so commonly evolved in nitration work. These give rise to what is commonly called "fume sickness," and the danger is greatest in the nitration of cotton to nitrocellulose and in the nitration of phenol to picric acid, trinitrophenol. The higher the nitration the greater is the danger and at the time of the author's examination the cases of poisoning were so frequent from the so-called "fires" that the workmen had become fairly well accustomed to them. The tables show 1,389 cases of poisoning from hydrogen oxids (995 from nitrocotton plants, 381 from picric acid and thirteen from nitric acid works), varying in severity from light to fatal. In light cases the man chokes up and the symptoms resemble asthma and are relieved by the usual first aid remedy. Severe and fatal cases resemble those of gassed soldiers from the trenches. The well developed cases are easily recognized but the less violent poisoning may result in pneumonia which often passes for the ordinary non-occupational type. Sometimes, this may lead to gangrene of the lung or other fatal forms of pulmonary edema may occur. Men have succumbed in their first shift of work and their lungs and blood have been examined by competent experts. After the cotton has been nitrated there is no further danger of poisoning. The next step is the conversion of nitrocotton to smokeless powder, which is a different operation. The making of picric acid is a simple matter and in some improvised manufactories has been carried on in a rather reckless manner. A further danger is in the dust that forms when it is dried down. The greatest danger in the manufacture of phenol is in the benzene fumes and benzene and toluene are considered together. Just half of the cases of benzene poisoning were fatal. The fumes have a specific action on the nervous system leading to dizziness, confusion, transient excitement followed by dullness, muscular twitchings, stupor and coma, rapid respiration followed by slow, rapid pulse and subnormal temperature. Multiple small hemorrhages are formed, through a solvent action on the capillary endothelium, or enlargement of fat emboli and marked changes in the blood. All the deaths that occurred on the author's list were sudden, sometimes strikingly so. All the nitro and amido derivatives of the benzene ring have certain characteristics in common in their poisonous action but vary quite a little in some respects. Curschmann believes the higher the nitration the greater the toxicity, but sometimes the lower nitrations are more volatile or more easily absorbed and, therefore, more dangerous. The symptoms typical of poisoning of this group depend on direct action on the nerve centers, respiratory, heat regulating and vasomotor, and on changes in elements of the blood, of which the more important are the formation of methemoglobin and the destruction and subsequent forming of blood corpuscles. The volatile compounds, such as analin, nitrobenzene, produce their effects rapidly. Nitrobenzene cases of poisoning are fewer than those of anilin but more severe. The local effect of some of these compounds on the skin is much more pronounced than in the case of others. With trinitrotoluene, the absorption takes place much more slowly and instead of skin symptoms there may be degeneration of inner organs. The poisoning is not rapid, and immature workers are more susceptible. The possibility of mercurial poisoning in fulminate workers has to be considered, but at present the dermatitis which is quite common, has been the only form recognized. Other occupational poisonings are those from the manufacture of smokeless powder and ether intoxication which is so common as to be taken as a matter of course, and it is not hard to find men who have been obliged to quit work because of the continual taste of ether in the mouth causing indigestion, constipation, loss of weight and strength. Nitroglycerin is the safest of all explosives as regards poisoning, not as regards accidents, and the precautions against these latter act also as preventives of systemic poisoning. Other poisons in gaseous form are chlorin fumes given off during the early stage of nitric acid manufacture, ammonia fumes, and sulphur dioxid. The subject is a good one for further research by all who are interested in the effects of volatile poisons on the human subject.

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Hours, Fatigue, and Health in British Munition Factories.—*Bulletin Number 221* published by the United States Department of Labor, Bureau of Labor Statistics, is of great timely interest, dealing with munition manufacture in England. The painstaking investigations carried on by the British Government will undoubtedly be of great value to this country in meeting similar problems. The British Health of Munition Workers' Committee was appointed in the middle of September, 1915, by the minister of munitions to carry on studies referred to in the title of the bulletin. Some of the more important conclusions reached are given herewith. A weekly period of rest is held to be essential. The output of munitions is not increased by continuous work. For economic and social reasons this weekly period of rest is best provided on Sunday. The committee prefers a system of shifts to overtime work, citing five reasons for this stand. Admitting, however, that overtime must continue, the committee suggests definite reductions to govern it. Women ought not to exceed the normal legal limit of sixty hours per week and the same applies to boys under sixteen years of age. There are various objections to nightwork: It is uneconomical; supervision is frequently unsatisfactory; lighting conditions are unfavorable; workers do not obtain a good rest during the day; the disarranged schedule of living interferes with proper digestion. Men engaged in very heavy labor show an optimum output when the weekly hours of labor are fifty-six, or less. For moderately heavy work the best output is obtained with sixty hours' working schedule. A ten minute break in the middle of the morning and afternoon has been found a valuable aid to output. The committee deplores the fact that munition workers in general have been allowed to reach a state of reduced efficiency and lowered health. It points out the failure to give proper attention to personal hygiene. Medical examination on admission seems indicative of a preliminary safeguard. Machinery must be safeguarded to prevent the large number of accidents. First-aid stations must be available. The committee also reports on causes, methods of prevention, and treatment for the principal industrial diseases which have been found to affect munition workers. All cases of sickness must be treated at once. Particular attention must be paid in munition factories to ventilation and lighting. Bad lighting not only decreases the output but also causes headaches and other troubles.

Bulletin No. 221 is the first of a group of bulletins to be published by the Bureau of Labor Statistics in compliance with a resolution voted April 7, 1917, by the Council of National Defense.

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Industrial Accident Mortality.—*Bulletin 207* of the United States Department of Labor, Bureau of Labor Statistics, deals with the "Causes of Death by Occupation." The bulletin is prepared by Louis I. Dublin and represents an account of the occupational mortality experience of the Metropolitan Life Insurance Company. There are available the records of 94,269 deaths that occurred in the three years, 1911, 1912, and 1913 among occupied olite males, and of 102,467 deaths in the same three years among olite females, at ages fifteen years and over, insured in the industrial department of the company. Certain definite conclusions are justified by this study. There is a clear and direct connection between the causes of death and the occupation of the deceased. Dusty trades, for instance, show a high tuberculosis death-rate. Sedentary employment likewise influences the tuberculosis mortality. An undue amount of alcoholism is associated almost invariably with an excess of cirrhosis of the liver and of Bright's disease. The mortality from lead poisoning is high. The respiratory diseases are prominent when the worker is exposed to the cold, drafts and dampness or to violent changes in temperature. Organic diseases of the heart are frequent when the work is heavy and the cardiac powers are overtaxed. Mortality is not the only measure of the effect of industrial work. Many occupational diseases do not directly cause death and secondary diseases terminating fatally may set in.

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Hookworm in Chinese Mines.—The April issue of the *New Orleans Medical and Surgical Journal* contains an interesting article by Dr. W. L. Chow of the Hunan-Yale Medical Hospital in China, on "Hookworm Investigation in the Antimony Mines, Sinhwa, Hunan Province, China." The study was made possible by a grant from the International Health Board of the Rockefeller Foundation. The altitude of the mines is high and the soil on the surface is dry and porous; therefore there is little chance for hookworm eggs to hatch. The danger lies in the fact that infected feces are carelessly disseminated. Unless sanitary conditions are installed the mines will eventually prove an endemic centre for hookworm. Thirteen persons out of 149 proved to be infected. All of these infected persons had until recently been farmers in the rice fields. The eradication of hookworm disease in the antimony mines can be accomplished without great difficulty if proper measures are taken. The miners as well as the mine owners must be educated. To lessen the danger of importing hookworm disease into the mines it is necessary to prevent infection in the fields and to discourage the time-honored use of human excreta for fertilizer.

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The President of the American Museum of Safety has made public the reports of the Jury of Award covering the awards of the five gold medals annually conferred by the museum for noteworthy achievements in the realms of accident prevention and health conservation. The winners for 1916 are the Pullman Company, the Commonwealth Steel Company of St. Louis, Mo., the Julius King Optical Company of New York City, the Alabama Great Southern Railway Company and the Connecticut Company at New Haven, Conn. The dinner planned in connection with the presentation of the medals of the museum was cancelled on account of the present national crisis.

The museum has tendered its services to the national, state and city governments. It has also offered all of its facilities to the Council on National Defense, Washington.

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New Railroad Safety Device.—According to "Safety Engineering" (April) the Queen & Crescent Railroad has lately equipped its route with a signal system, train, and speed control. Practical tests have shown the device to be efficient. The system is entirely automatic. A train can be started under full head of steam, and will never collide with another, because the moment it enters a block occupied by another train, it is stopped by the application of the emergency brake. The device includes a caution signal which does not stop the train but slows it down to a predetermined speed and prevents the train from exceeding that speed. The speed control is a separate device which may be attached to any car of the train and can be set for any desired speed. Once set and in operation, the train cannot exceed the speed indicated.

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Two interesting accounts of how nations manage their food supply under war-times conditions can be found in the May issue of the *Monthly Review of the United States Bureau of Labor Statistics.* The articles deal with the government control of food supplies in Germany and Italy.

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In an effort to bring about coöperation in industrial sanitation and hygiene between organized labor and the division of industrial hygiene of the New York City Health Department, thirty-eight labor unions affiliated with the Central Federated Union met on February 18, 1917, and organized the Labor Sanitation Conference. The Department of Health hopes in this way to become better acquainted with the possibilities for improving safety and sanitary standards.

Communications.

May 31, 1917.

To the Editor:

In the issue of the Journal of May, 1917, on page 521, under the title of "Communications," Dr. C. B. Young, late commissioner of health of Chicago, criticises the Commission on Milk Standards in part as follows:

"In as much as the very valuable report of the Commission on Milk Standards of the New York Milk Committee, published in the United States Public Health Reports for February 16, will be generally accepted by those interested in the milk question as an accurate summary of the development of the grading system, it seems unfortunate that in enumerating the cities where the plan has been taken up no mention is made of Chicago.

"This omission is all the more singular because it happens that Chicago legislation on grading milk anticipated by more than four years the position recently reached by the commission."

Doctor Young then attempts to briefly summarize the recommendations of the commission published in its last report, and draws a parallel between this and an ordinance drawn up for the city of Chicago, which he says was dated August 14, 1912.

Concerning this Chicago ordinance, Doctor Young says:

"The ordinance containing the above provisions was passed August 14, 1912,—so long ago that the commission probably forgot it when preparing in 1916 to make its latest recommendations.

"The matter of course is only of interest to those concerned with the accuracy of sanitary history and to the authors of the Chicago ordinance, Assistant Health Commissioner Godfried Koehler, and the writer."

As secretary of the Commission on Milk Standards, I feel that it is incumbent upon me to defend the commission against the suggestions of inaccuracy and unfairness to Chicago contained in Doctor Young's communication. The fact that he refers to the 1916 report of the Commission on Milk Standards as containing "its latest recommendations" makes it evident that Doctor Young is aware that the latest report of the commission is not its first report. In the last report of the commission the history of the commission's work is plainly stated, and there is also included a statement regarding the history of the grading of milk in America. A study of this history makes it impossible to understand how Doctor Young can find any support for his statement "that Chicago legislation on grading milk anticipated by more than four years the position recently reached by the commission."

The Commission on Milk Standards was organized in the spring of 1911. It held two meetings in that year, namely, in May and October, and a third meeting in January, 1912. The results of the work at these three meetings was given considerable publicity previous to the publication of the first report.

The first report of the commission was published in United States Public Health Reports, May 10, 1912. This report recommended that milk should be graded into four classes, as follows:

Class A, certified milk, or its equivalent.

Class B, inspected milk.

Class C, pasteurized milk.

Class D, milk not suitable for drinking purposes.

In this classification A and B were raw milks from tuberculin tested cows, produced in accordance with recognized sanitary safeguards, and having bacterial standards. The commission also made recommendations regarding bacterial standards, the control of pasteurization, and the use of the standard methods of the American Public Health Association for making bacterial tests of milk.

The New York City Department of Health, which was represented on the commission, adopted a system of grading on January 4, 1912, at which time the regulations provided for three grades of milk, as follows:

Grade A, for infants and children, including: certified, guaranteed, and inspected raw milks; and a selected pasteurized milk.

Grade B, for adults, including a selected raw and pasteurized milk.

Grade C, for cooking purposes.

Consequently, if the Chicago ordinance to which Doctor Young refers was dated August 14 in 1912, it was passed more than three months after the publication of the first report of the Commission on Milk Standards; more than seven months after the New York City regulations for grading milk were passed; and more than fourteen months after the first meeting of the commission.

The Commission on Milk Standards is certainly just as much "concerned with the accuracy of sanitary history" as is Doctor Young, and is much more interested in securing recognition for the grading of milk than in any controversy over priority. In drawing up the report of the commission perhaps the editorial committee should have included the statement that Chicago adopted a grading system of milk in August, 1912, but this action of Chicago certainly did not anticipate "by more than four years the position recently reached by the commission."

The several reports of the commission have all been progress reports. Its report of 1912 outlined the plan for grading agreed upon by the members at that time. Its report for 1913 further modified this plan in an attempt to make it better adapted to all communities. Its report of 1916 contained further modifications, and an attempt to make it practicable to extend the grading system even to small towns. The conclusions contained in the 1916 report are not "recent," but are merely an extension of the conclusions which were contained in its first report published in the spring of 1912.

Charles E. North,
Secretary, Commission on Milk Standards.

Personal Notes.

President William A. Evans has been appointed general chairman of a committee on the health of employees of the National Defense Advisory Council. Dr. E. R. Hayhurst, the chairman of the Section on Industrial Hygiene, at the request of Doctor Evans has created the following subcommittees:

1. Shop and Industrial Sanitation, Dr. George M. Price.
2. Industrial Diseases, Dr. J. W. Schereschewsky, Dr. E. R. Hayhurst, Dr. B. S. Warren, and Dr. F. D. Patterson.
3. Industrial Poisons, Dr. Alice Hamilton, Dr. J. B. Hudson, and Dr. George F. Apfelbach.
4. Village and Public Sanitation, Dr. George M. Kober, Dr. Lawrence Veiller, and Dr. W. C. Woodward.
5. Ventilation, Including Heating, Prof. C.-E. A. Winslow, Mr. D. D. Kimball and Mr. Rudolph Herring.
6. Medical Supervision, Dr. Otto P. Geier, Dr. Harry E. Mock, Dr. Clarence D. Selby, Prof. Henry W. Farnum, Carl E. Smith (D. D. S.).
7. Female Employees, Dr. Kristine Mann.
8. Diagnostic Clinics, Dr. Louis I. Harris.
9. Abnormal Atmospheric Pressures, Dr. F. L. Keays.
10. Lunch Rooms, Mr. R. C. Routsong.

In each incident the first named person is to serve as the chairman of the subcommittee. Each committee is to submit both standards and recommendations (for the time being essentials only) covering the subject assigned to that committee and to arrange to conform to the following:

(a) "Items so vital that they should be embodied in contracts" which the government makes with manufacturers or others.

(b) "Items of second importance, to be brought to the attention of manufacturers, and in some instances to laborers, also eventually to be made laws," these to be transmitted within one month.

(c) "Items of third importance, to be made the subject of educational propaganda"—transmitted at more subsequent date.

The general order of application of standards and recommendations to be, first, for those industries making high explosives, next arms and ammunitions, next heavy war machinery, and thereafter other industries engaged less directly in the military preparations, and eventually, possibly to all industries.

In anticipation of the social and economic problems likely to result from the German-American War, the National Council of Defense, through its Advisory Commission on Labor and Welfare—Mr. Samuel Gompers, chairman—has appointed Mr. Frederick L. Hoffman, statistician of the Prudential Insurance Company of America, chairman of the National Committee on Statistics and Information. The Prudential has offered the resources of its statistical department to the Advisory Commission, and subcommittees will shortly be organized in anticipation of the demand for trustworthy statistical and other information required by the national committees on wages and hours, women in industry, mediation and conciliation, industrial accident-prevention, etc. The plan is to inaugurate at once a national statistical service, whereby the state of the nation regarding health, physical and social wellbeing, sickness and accidents in industry, unemployment, etc., may be presented with scientific conclusiveness from week to week, for the information of the National Council of Defense and the public at large.

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Dr. Eugene Lyman Fisk, medical director of the Life Extension Institute, 25 West 45th Street, New York City, has been appointed a member of the subcommittee on alcohol of the Committee on Hygiene and Sanitation of the General Medical Board of the Council of National Defense, of which Surgeon-General Rupert Blue is chairman.

Surgeon-General Rupert Blue is also a member of the Life Extension Institute's Hygiene Reference Board, which is composed of one hundred of the most eminent scientists in the United States and Europe.

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Dr. Joseph Yates Porter announces that he has resigned as state health officer of Florida and that Dr. Joseph Enoch Taylor has been appointed as his successor.

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Mr. A. D. Hiller, formerly assistant editor of the American JOURNAL OF PUBLIC HEALTH, and assistant to the secretary of the American Public Health Association, has been appointed agent of the board of health and milk inspector of Watertown, Mass.

Dr. Arthur Lederer has been appointed director of the state Hygienic Laboratory at Morgantown, W. Va.

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Dr. Francis H. Slack, deputy commissioner of health of the Boston Bacteriological Laboratory, has resigned to accept the position as pathologist, bacteriologist and serologist in the Sias Laboratory, Brooklyn, N. Y.

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Dr. David D. Brough has been appointed deputy commissioner of health of Boston to succeed Dr. Thomas B. Shea, deceased.

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Dr. Leverett D. Bristol of Boston, Mass., has been appointed state health officer of Nebraska.

◆

Dr. Charles J. McGurren has been appointed superintendent of health and secretary of the State Board of Health of North Dakota.

◆

The Massachusetts State Department of Health, upon April 3, voted that lobar pneumonia be added to the list of diseases declared to be dangerous to the public health, and that that disease be declared reportable on and after May 1.

◆

The following persons were elected to membership in the American Public Health Association:

J. F. Williams, M. D., Detroit, Mich., Health Officer of Detroit.

J. W. Inches, M. D., Cincinnati, Ohio, Director and Professor Hygiene and Physical Education, University of Cincinnati.

Frederic W. Howe, Framingham, Mass., Professor at State Normal School.

J. W. Duke, Guthrie, Okla., Physician, State Commissioner of Health.

Dr. Ralph Oakley Clock, Pearl River, N. Y., Assistant Director Lederle Antitoxin Laboratory.

Thorndike Saville, Cambridge, Mass., Assistant in Municipal Administration and in Geology, Harvard University.

Luther A. Riser, M. D., Columbia, S. C., Health Officer.

George J. Coleman, P. D., Wheeling, W. Va.

Myron E. Fuller, Philadelphia, Pa., Sanitary Engineer with Bureau of Surveys, Philadelphia.

P. E. Mebus, Philadelphia, Pa., Civil and Sanitary Engineer, Bureau of Surveys.

Arthur R. Reynolds, M. D., Chicago, Ill., Sanitarian.

Isaac S. Walker, Frankford, Philadelphia, Pa., Sanitary Engineer.

William Schroeder, Jr., M. D., New York City, Chief Surgeon and Medical Director of Employers Mutual Insurance Co.

W. H. Robin, M. D., New Orleans, La., Physician.

Willis P. Butler, M. D., Shreveport, La., Parish Health Officer.

Moses J. Miller, M. D., Cleveland, Ohio, Diagnostician.

Conrad H. Lieber, Oak Park, Ill., Sanitary Inspector.

Charles E. Low, M. D., Spartanburg, S. C., Director of Health.

Charles M. Siever, M. D., Manhattan, Kans., in charge of the Department of Student Health, Kansas State Agricultural College.

Kristine Mann, M. D., New York City, Physician.

F. C. Yen, M. D., New Haven, Conn.

Mr. Alton A. Cook, Morgantown, W. Va., Chemist, State Health Department.

Mr. Ira D. Joel, Middletown, Conn., Acting Director State Laboratory.

J. M. Shapiro, M. D., Denver, Col., Industrial Physician.

J. G. Frey, M. D., Cleveland, Ohio, Serologist, Health Department.

Francis L. Parker, M. D., Charleston, S. C., Chemist and Bacteriologist, State Board of Health.

Gordon Fehr, B. S., S. B., South Norwalk, Conn., Sanitary Engineer.

S. W. Welch, M. D., Montgomery, Ala., Health Officer.

Mr. J. V. Donley, Montgomery, Ala., Sanitary Engineer, State Board of Health.

Current Public Health Literature.

AMERICAN.

American City. New York.

XIV. May.

Water Costs in Cities of at Least 60,000 Population.
War Time Measures of Economic Preparedness and Social Welfare.

American Food Journal, Chicago.

XII. May.

Program for Food Production and Conservation.
The Manufacture of Sugar. J. E. Freeman.
Care of Confectionery. Walter C. Hughes.

American Journal of Diseases of Children, Chicago.

13. May.

Bacteriology of the Urine in Children with Vulvovaginitis. A. B. Schwartz.
Review of the Literature of the Past Five Years on Gonococcus Vulvovaginitis. J. C. Gittings and A. G. Mitchell.

Boston Medical and Surgical Journal.

CLXXVI. May 17.

Recent Investigations on the Bacteriology of Acute Poliomyelitis. Ludvig Hektoen.
Mouth Infections and Their Relation to Systemic Disease. P. A. Hudnut.

May 24.

A Study of Twenty-nine Cases of Echinococcus at the Massachusetts General Hospital. L. Davis and G. M. Balboni.
Mental States Responsible for Malingering. E. B. Emerson.
Observations on Measles. D. M. Lewis.

May 31.

Drug Users in Court. V. V. Anderson.
Shiftling, Charlatan and Vagabond: Who They Are and How They Arise. J. V. Haberman.
Comparative Statistics on Physical Examinations of Pupils of the Boston Public Schools from December 1, 1915, to April 1, 1917. W. H. Devine.

Journal of the American Medical Association, Chicago.

LXVIII. May 5.

An Epidemic of Septic Sore Throat Due to Milk. E. C. Rosenow and C. L. V. Hess.
Septic Sore Throat. G. W. Henika and I. F. Thompson.
Untoward Results of Prophylactic Typhoid Immunization. W. Lintz.
Endemic Index of Malaria in the Northern Sacremento Valley. F. L. Kelly and J. C. Geiger.

May 12.

The Supplementary Dietary Relations among Our Natural Foodstuffs. E. V. McCollum.

Application of the Complement Fixation Test to Tuberculosis. N. B. Burns, F. H. Sclack, P. Castleman, and K. Bailey.
Usefulness of Serums and Vaccines under War Conditions. G. W. McCoy.

May 19.

Industrial Poisons Encountered in the Manufacture of Explosives. Alice Hamilton.
The Therapeutic Value of Pertussis Vaccine in Whooping-Cough. A. I. Von Sholly.
Treatment of Carriers of Endamœba Histolytica with Oil of Chenopodium. E. L. Walker and W. Emrich.
A New and Superior Mercurial Germicide. J. F. Schamberg, J. A. Kolmer, and G. W. Raiziss.
Pertussis Vaccine: Its Value as a Curative and Prophylactic Agent in Whooping-Cough. Paul Luttinger.
The Teaching of Protozoology to Medical Students. F. G. Haughwout.

May 26.

Anaphylatoxin and Anaphylaxis. F. G. Novy and P. H. DeKruif.
An Antipoliomyelitis Horse Serum. M. Neustædeer and E. J. Banzhaf.
Poliomyelitis: Some Features in City Prevalence. C. V. Craster.

Journal of Laboratory and Clinical Medicine, St. Louis.

II. May.

Animal Inoculations Supplementary to an Introductory Course in Pathogenic Bacteriology. W. H. Manwaring and J. T. Connell.
Toxicity of Heterologous and Homologous Serums. C. E. Roser.
Concerning the Chemistry of Pernicious Anemia. T. L. Squier.

Journal of Industrial and Engineering Chemistry, New York.

IX. April 1.

A Study of Certain Ferments with a View of Determining a Method for the Differentiation of Pasteurized Milk from Raw Milk. I. Reductases. R. E. Lee and M. G. Mellon.
Is the Recovery of the Nitrogen in Sewage Practicable? W. R. Copeland.
Storage Reservoirs as a Factor in the Purification of Surface Waters. S. T. Powell.
Some Remarks on the Biochemical Treatment of Sewage with Especial Reference to the Activated Sludge Method. G. T. Hammond.
Re-æration as a Factor in the Self-Purification of Streams. E. B. Phelps.

May 1.

The Correction Required in Applying the Babcock Formula to the Estimation of Total Solids in Evaporated Milk. O. L. Evenson.
Fertilizer Value of City Wastes. P. J. Schroeder.

Journal of Outdoor Life, New York.

XIV. May.

Family Care of the Tuberculous. F. M. Stein.
Home Treatment of Tuberculous. A. Henry.

Medical Times, New York.

XLV. May.

Attitude and Responsibilities of the Physician in the So-Called Birth Control Movement. G. W. Kosmar.
Social and Legal Aspects of the Birth Control Propaganda. J. S. Sumner.
A New Phase of the Drug Addict Laws. T. D. Crothers.

Military Surgeon, Washington, D. C.

XL. May.

Recent Developments in Camp Sanitation. W. F. Lewis and R. B. Miller.
Standardization of Food Inspection. W. N. Garton.
Notes on the Organization of the French Sanitary Service. J. R. Church.

Modern Hospital, St. Louis.

VIII. May.

Urban Community Plan for Health and Medical Service. D. B. Armstrong and J. H. Berkowitz.
Ice Cream—Its Composition, Manufacture, and Value. J. P. Street.
Standardization of Hospitals—Comment on the Classification. J. A. Hornsby.

Medicine and Surgery, St. Louis.

I. May.

Gonorrhea and Its Dangerous Possibilities. C. M. Whitney.
Clinical Consideration of the Wassermann Reaction. M. G. Wohl.
Behavior of the Wassermann Reaction in Cases Receiving Mixed Treatment. H. C. Solomon.
The Fetich of the Wassermann Reaction. H. H. Hazen.

Southern Medical Journal, Birmingham.

X. May.

Public Health Facts and Their Presentation. R. K. Flannagan.
Control of Contagious Diseases. C. V. Reynolds.
Advances in Public Health Work in South Carolina During the Past Year. J. A. Hayne.
The County Unit Plan in Public Health. M. M. McCord.

U. S. Public Health Reports, Washington, D. C.

32. May 4.

Typhoid Fever and Municipal Administration. A. W. Freeman.

May 11.

Conference of Health Authorities.
Drinking Fountains. H. A. Whittaker.
Mechanical Fans. S. B. Grubbs.

May 18.

Control of Poliomyelitis.
Mental Examination of Immigrants. E. H. Mullan.

May 25.

Standard Morbidity Tables.
Public Health Administration in South Bend, Ind. Carroll Fox.

BRITISH.

Journal of State Medicine, London.

XXV. April.

The Rôle of the Midwife and the Protection of Motherhood. Lady Barrett.

The Prevention and Arrest of Certain Epidemic Diseases in War Time. S. M. Copeman.

The Control of Rat Plague. C. O. Stallybrass.

Medical Officer, London.

XVIII. April 21.

Measures to be Taken to Prevent Contamination of Food by Flies. J. Cates.

May 5.

The Health of the People.

Some Problems of Child Welfare. G. Jessel.

May 12.

Health of Munition Workers—Interim Report.

The Proposed Ministry of Health—Considerations and Suggestions.

BOOKS AND REPORTS RECEIVED.

Water Purification. *By J. W. Ellms, 1917. McGraw-Hill Book Co., Inc. New York City. Pp. 485. Price, $5.00 net.*

Sanitation Practically Applied. *By Harold B. Wood, M. D. 1917. John Wiley & Sons, Inc. New York City. Pp. 473. Price, $3.00 net.*

Mental Conflicts and Misconduct. *By William Healy. 1917. Little, Brown and Co., Boston. Pp. 33. Price, $2.50 net.*

The Psychology of Special Abilities and Disabilities. *By Augusta F. Bronner. 1917. Little, Brown and Co., Boston. Pp. 268. Price, $1.75.*

Food Poisoning. *By E. O. Jordan, M. D. 1917. University of Chicago Press, Chicago, Ill. Pp. 115. Price, $1.00 net.*

Report of the State Board of Health of Wisconsin, 1915–1916.

State Work against Infantile Paralysis. *Steps Taken by Forty-Three Departments of Health in 1916. Institute of Public Service, 51 Chambers Street, New York City.*

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MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH.

THE regular Quarterly Meeting of the Association was held at the Brunswick Hotel, Boston, Thursday, April 26. Dr. Francis X. Mahoney, President, presiding.

The President announced that the October meeting would be held in Pittsfield.

Upon the recommendation of the Executive Committee the following members were elected: Dr. J. William Ledbury, Uxbridge, Mass.; Joseph N. Roy, Chairman, Board of Health, Webster, Mass.; Leon J. Kreft, Secretary, Board of Health, Webster, Mass.; Dr. Henry E. Chaput, 77 Cabot St., Holyoke, Mass.; Dr. C. L. M. Holmberg, 1111 Warren Ave., Brockton, Mass.; Dr. Adelbert M. Hubbell, 32 Summer St., Haverhill, Mass.

Names of the following members who had died during the previous year were read by Dr. Francis H. Slack, Secretary, and the names were ordered spread on the records: Dr. Thomas B. Shea, Boston; Dr. G. B. Underwood, Gardner; James C. Clark, Wareham.

The following discussion was then presented on—

THE RELATION OF STATE AND LOCAL BOARDS OF HEALTH TO GENERAL PREPAREDNESS.

Dr. Allan J. McLaughlin. Mr. Chairman, Fellow Members of the Massachusetts Association of Boards of Health: I appreciate the very great honor of having this opportunity to address you. I have no paper to read; I have had no time to prepare a paper. As I told my good friend Doctor Mahoney, I was prepared to open the discussion even if I had to use a can opener; but I don't propose to make a speech, or go further than that. I come here to learn, and would like to hear the free expression of ideas that will probably follow when we open the ball.

In the matter of hygiene and sanitation the complications that are incident to a state of war, simply enhance the importance of the problem of hygiene and sanitation in time of peace. This problem of hygiene and sanitation splits itself into two very unequal parts: first, the hygiene and sanitation of the soldier and sailor, the fighting units, and second, the hygiene and sanitation of the civilian population, including all the exempt groups. You will naturally see, gentlemen, that the larger part of this problem, after all, is the hygiene and sanitation of the civilian population, and if health officers and trained sanitarians are valuable and necessary in time of peace they are doubly valuable and necessary in time of war, with the added problems which come with a state of war. The hygiene and sanitation of the soldier and the sailor will be adequately cared for by the very excellent medical corps of the United States Army and the medical corps of the United States Navy, with their reserve forces, and they will have probably their hands full to take care of this job, there is no doubt about that. And the other, the larger part of the problem, is your problem, gentlemen, and my problem. It is the problem which we handle 365 days in the year in time of peace, and which we will have to keep on handling in time of war, with its added difficulties and complications. I feel certain that the local boards of health appreciate this fact. They do not feel because there is a state of war that their obligations or duties are lessened in any way; I think they all feel that they are increased, that they are to keep on doing their work.

Now, it is evident that what we need if we have to do this work is some uniformity of action and some centralization of direction. The local boards of health naturally want to do their work, should do their work; they don't want anybody to come in and do their work for them, but it should be done under the general direction of some central authority, and the first step in that direction is the direction of the local work under state authority. It is unthinkable that we would go ahead on any general policy of sanitary work with forty-eight different systems in forty-eight different states. Here again you must have centralization, and naturally the federal public health service will be the agency which will coördinate the efforts of the state health organizations, and through them the local health organizations of the entire country. On Monday there is a conference in Washington called by the surgeon-general of the public health service with the executive health officers of every state in the union, to discuss this matter of the relation between federal and state authorities in this national crisis.

In England it was a very simple matter. They have a small country. They are not hampered by state law. They are not hampered by our democratic institutions, for which I feel sorry for them, and they have a simpler way of doing things. These things have to be done in a more complicated, more roundabout way in the United States, but that does not mean that they will be done less efficiently. On the contrary, we have every evidence that we are going along every day (and when I say "we" I mean the whole country, from the humblest citizen to the national council of defence at Washington), are going along every day in the direction of preventing the blunders which have been committed by England and by France. I only hope that instead of a volunteer system, which permitted those blunders to become effective in England, we will have some kind of sensible universal service, selective draft, call it what you will, which will enable us to avoid the blunders which England made.

Of course you all know what happened, without reciting that, in the first 100,000. They went out indiscriminately. They grabbed anybody who offered to carry a gun. They took the best brains in the country. They took the highest trained technicians, industrial chemists, doctors, lawyers, anybody else that could carry a gun, put them into the trenches, where they were slaughtered by thousands. After they recognized their blunder they tried to recall what remnants there were, those that had not been killed but some of whom had been wounded. They brought back four year and three year medical students who had been allowed to go out instead of concluding their course, put them back to finish their course and get their degree. But, gentlemen, they will not be able in this generation to replace the waste and loss of highly trained technical material that took place through that horrible blunder of allowing indiscriminate volunteering to go on. The volunteer system simply puts a penalty on patriotism, penalizes the man who has patriotism enough to enlist. Now, I think we are going to avoid that, and I think that in addition we are going to try to get square pegs into square holes. I think it would be a great crime if a trained sanitarian in this state, one of our good local board of health men, should go into the army. I say that with all due deference to my good friend, Colonel Chamberlain, and I think he will agree with me. They can get just as good material for their purposes without taking the trained sanitarian, who is probably over the age limit in most instances anyway, and who probably will not be called out in that way. But if we should have a highly trained sanitarian doing good service at home and taking care of the people in his own city that man should stay there and not be drafted into another service, the duties of which he would have to learn, which would be using a razor with which to chop down a tree.

There is one other thing I want to touch on, and that is the use of the public health nurses. When we started out to investigate just what the ideas of the public health nurses of the state were, most of them we found had signed up in some way with the Red Cross. Well, this is all very estimable and all very nice, and we are hearty in our support of the Red Cross in its functions, but we believe that the material for a Red Cross nurse is quite as good fresh from the surgical hospital, if not better, than that secured by taking from public health work in the field. On the other hand, as you all know as health officers, it is very difficult to replace the successful visiting public health nurse. Now, I think that also will be remedied. A clearer understanding has come, and I think the Red Cross are very willing to nullify whatever agreement they had with these ladies, so that they will continue to discharge their public health functions with local boards of health throughout the state.

In addition to the work which you have to do every day in the year you will, as I say, have added functions. Now, in addition to this there will be other medical work which is contemplated by the committee on hygiene, medicine and sanitation, which will not be strictly public health work, which will not be strictly board of health work, and I refer to the medical and surgical care of the exempt groups in the civilian population, which may be put upon us. You may say that is a very remote possibility, it is not a probability, and that is true; but in any contemplation of preparedness you must contemplate the possibility rather than the probability. I have defined preparedness as a margin of safety over the maximum of possibility. It is the best definition of preparedness I can think of. We may never have to go to that length; at the same time we must consider it, and, gentlemen, we must consider the medical and surgical care of large groups of people. Now, it may be a very small group at first. It may be simply the dependents of the soldiers, who are left behind. But beyond that your minds can conceive at once of a lot of conditions that might occur, in which other large groups would be put upon you for medical or surgical care. You might have the blowing up of a large munitions plant in your district, in which you would have several hundred wounded suddenly thrust upon you. To take care of those is a little outside the regular work of the health officer, and I believe that the best way to handle that situation is through a local committee on hygiene, medicine and sanitation, to correlate with the state committee, of which I have the honor to be chairman, and that this committee in each city and town would organize their medical personnel in such a way that they would be prepared to take care of practically any emergency which might be put upon them. That is what the state committee on public safety has tried to do, to have organized in each city and town in the commonwealth a local committee, not only a committee of public safety but a subcommittee on hygiene, medicine and sanitation, which would organize the local medical personnel for any emergency that might arise. They would have to help not only the local board of health in its work, not only take care of the civilian population, but give every aid possible to the military in getting recruits, to aid them in so far as they might be permitted in examining recruits, or weeding out, at least, those that were obviously unfit for service, and numberless other duties that will suggest themselves to you.

I think that is as far as I care to go, gentlemen, to point out first that we must keep on our job, that the health officer must work as he has never worked before, that he must coöperate with his local committee on hygiene, medicine and sanitation, in order to see that medical and surgical care is furnished to every group that might need it, and to continue in this work and to look for direction first to the state and second to the federal government, so that we may have uniformity of action, and then, in addition to this, to render every possible aid to recruiting. There are very few things that we can do in a direct way. As Colonel Chamberlain will bear me out, the actual examination of the recruits in the United States Army must be made by an officer of the United States Army, but perhaps there is a good deal of preliminary work in weeding out that the local people can do, and this I am sure we are all very anxious to do.

COL. W. P. CHAMBERLAIN. Mr. President and Members of the Association: In the mind of the enthusiastic and patriotic civilian at a time like this the thought at once occurs: "What can I do to help along in military or medical military preparedness?" The first idea is apt to be that he must ally himself directly with the military forces if he is to be of service to his country in the crisis of war. More mature consideration will show that only a limited part of the population can serve directly, and that the majority must remain at their customary duties in order that the wheels of industry may revolve and that the army may be provided with the sinews of war. The laborer who makes the necessary munitions serves his country quite as well as the soldier who carries a rifle. Without the former the latter would be powerless. Without the continued maintenance of healthful conditions in our communities the very foundation of our military strength would be menaced. On you upon whom rests the duty of maintaining civic sanitation will devolve even greater responsibilities in time of war than in time of peace. In addition, while remaining at your posts and maintaining healthful towns and cities, you can offer very real and direct help to any military force located in your vicinity. I will now touch upon some of the matters in which you can be of direct assistance.

The experience of the past has been that almost invariably disease has been a far more serious danger to armies than have the weapons of the enemy. Among the diseases which have especially scourged armies may be mentioned typhoid fever, cholera and dysentery. A fundamental step in the prevention of these diseases is a safe water supply. If you have troops camped at your city or near your city, they will probably use your water supply in their camp. Even if they are otherwise provided for in camp they will drink of your water when visiting the town. Therefore you should be sure that your water supply is constantly supervised and fully protected from contamination.

One of the most common methods for the spread of typhoid fever, dysentery and cholera in camps is through the agency of the house fly; the house fly, of course, as you know, carrying the germs of the disease direct from infected stools exposed to the access of the fly, and from the stools directly to the food. The military authorities can limit the breeding of flies in the camp site, but they cannot prevent the migration to the camp of flies bred in the surrounding regions over which they have no control. It is a fundamental duty of the health authorities of a town to see to it that sanitary conditions are maintained among those living adjacent to any camp site in their vicinity. In such regions cheap eating houses and low resorts are almost sure to spring up, and experience has taught that insanitary conditions favorable to the breeding of house flies rapidly develop among such places that build up around the camps, unless the civil authorities are on the alert to coöperate with the military authorities.

The soldiers from camp will frequent the restaurants, the saloons, the soda fountains and the fruit stands of your town. You should see that such conditions are maintained in these establishments as will preclude the transmission of disease to the soldiers. One of the most important points will be a careful supervision of the milk supply. An examination of all cooks and waiters in restaurants and all those concerned in the handling of milk, with a view to detecting carriers of typhoid fever or para typhoid fever would be an excellent precaution.

If malaria prevails in your vicinity you should see to it that the region about the camp site is not furnishing mosquitoes to visit the camp and to infect its inmates.

Everything that you can do in the way of general sanitary improvement in your town or city will re-act favorably on the health of the adjacent military population. Care in the diagnosis and quarantine of measles is especially important. Among newly raised troops measles is always a serious menace. Epidemics invariably occur, and the mortality is always considerable. In our own service, even in time of peace, about five per cent. of the cases die. In a recent epidemic among soldiers in England the mortality was eleven per cent. Anything you can do to lessen the exposure of the soldiers to measles will be a real service to the army. If the town is a menace to the health of the troops in the vicinity the military authorities may of course keep their men in camp, prohibiting visits to the town. You should take it upon yourselves to render this action unnecessary, since such restrictions are undesirable both for the troops and for the adjacent community.

A constant and very important source of inefficiency in the army is venereal disease. In our base hospitals on the Mexican border during the last year from sixteen to twenty per cent. of the patients were suffering from venereal disease. The army regulation require that soldiers who have exposed themselves to the danger of venereal infection on returning to camp shall take prophylactic treatment. This in brief consists of an injection of protargol and an inunction of calomel ointment. Some soldiers do not take it, and others take it too late. So venereal infection keeps on among the soldiers. You can help the army by restricting prostitution and by examining such prostitutes as are allowed to practice their profession. Also by compelling prostitutes to maintain in their rooms facilities for cleanliness and some approved means for venereal prophylactic treatment. Some may think that sexual incontinence is confined mainly to soldiers in the regular army. Such is far from the truth. Among the regiments from the north and from other parts of the country on the Mexican border, the militia regiments that have been down there during the last year, venereal disease was extremely prevalent, and exposure to infection even more prevalent, as shown by the great number taking the venereal prophylactic treatment. While such conditions exist you can understand how important it is that your red light districts should be under proper supervision.

Safe, clean and sane amusement will be of great benefit to the soldier. He will frequent your theatres and moving picture shows, and you should see that these places are maintained in a sanitary, clean and well ventilated condition. Amusement and occupation when off duty will do much to keep the soldier from the brothel and the saloon. Efforts should be made by the community to provide amusement and companionship for the enlisted men of the army through the agency of the church, the Y. M. C. A., social organizations, and any other agency that may be at your disposal.

Courtesies extended by the boards of health and by the physicians in town to the medical officers of the camp will promote a coöperation and a good feeling which will be of mutual benefit. The boards of health should notify the commanding officers or the senior medical officers of camps regarding any insanitary conditions in their towns, or any infectious diseases, which might re-act unfavorably on the health of the troops. If the municipality maintains a laboratory it will often be of much assistance to the military surgeons in the vicinity to have its facilities put at their disposal.

Even if you have no camp in your vicinity you can be certain that some men from your towns or cities will be soldiers. These, as well as other soldiers, will come to your towns on visits. The best interests of the army will be promoted if the sanitary condition of your communities is such that no soldier on returning to his command will take with him an infectious disease which may not only disable him but may also spread infection among his comrades in arms.

If our country should be unfortunate enough to be invaded in certain sections, great quantities of refugees will retreat, will hurry away, in advance of the enemy, and may come crowding into your towns and cities, and if that unfortunate event should happen the responsibilities placed upon the health authorities in the way of maintaining sanitation among the refugee camps which would have to be established will be very great. There, again, you could be of the greatest service to the army and to the country.

Finally, in your capacity as health officers you can spread the information among the younger men in your vicinities that large numbers of physicians are at present needed in the medical corps and the medical reserve corps of the army. As a result of the increases in the regular army which were made last June there are about 200 vacancies in the regular medical corps at the present time, and will be about 200 more vacancies on the first of July. If the President should exercise his authority to make all the increments in the regular army at once the number of vacancies on the first of July would be very much greater. What the regular army wants is well trained, physically fit physicians, between the ages of 22 and 32, and who have had a year's hospital experience after graduation. To these the army offers a favorable opportunity for a life career. For the medical reserve corps the army wishes men between 22 and 55 years of age. Men entering the medical reserve corps are commissioned in that corps on the inactive list, and in time of need are called to the active list, when they receive the same salary and other perquisites that appertain to officers of the regular service. If we have to raise an army of a million men approximately 10,000 medical officers will be required. At the present time we have about 500 officers of the regular service, about 800 in the militia and approximately 3,000 in the reserve corps, leaving somewhere between 5,000 and 6,000 more medical officers whom we must obtain if we are to properly man this army of only a million men, and we know from experience on the other side that an army of a million men is not so very large after all. Therefore you should encourage the men who are physically fitted and of proper age in your vicinity to join either the regular army medical service or the medical officers' reserve corps.

Gentlemen, these are some of the ways in which you can directly assist the army, whether in peace or in war. By persistent and intelligent action along these lines you will contribute to the cause of national preparedness and give a very real contribution, and at the same time you will be promoting the interests of the United States which have been entrusted to your care.

PROF. HAROLD C. ERNST. Mr. President, Gentlemen: After listening to the two preceding speakers what I have to say may appear to cover too narrow a piece of ground, but I believe that they will acknowledge that it is one of the important factors in a general scheme of preparedness. What I have to say has to do with a practical job that was put on my shoulders, primarily from the surgeon general's office a little over two months ago; secondarily, but primarily now, as the chairman of the sub-committee on the mobilization of the laboratories of the state under the authority of the auxiliary Committee of the Council for National Defence.

The specific thing that I have been trying to do, and that you can help in completing, is to find out and ally together the laboratory resources, wherever they may be situated, throughout the state. The first line of effort that was suggested, came from the surgeon general's office and was supported by Colonel Chamberlain, and that is in case of mobilization to be prepared to search through the troops that are mustered into the federal service primarily for carriers of typhoid and para typhoid; secondarily, to be prepared to handle other laboratory questions that might arise in the concentration camps. Now, there are practical difficulties in the way of such an enterprise. If the quota of the state runs up to 20,000, 25,000, or 30,000 individuals, the job of investigating all of those persons, even for a single thing, as carriers of typhoid and para typhoid, is an extensive one, and we must have trained men, who are competent to do it. That really is the main excuse for my being here today, to ask any and all of you who have information of persons trained in such laboratory technic, who would be willing to take part in such a line of work, to turn over their names, or have them send their names to me, so that the personnel may be as nearly as possible completed.

Doctor McLaughlin some days ago honored me by joining me on this committee of preparedness of the laboratories, so that we have the state laboratories to call upon,—the personnel. Doctor Mahoney did the same thing for the city laboratories. The Institute of Technology has joined also. I had the pleasure the other evening of addressing the Boston Bacteriological Club, many of whose individual members are going to join in. There are associated on the committee with me also experts in parasitology in toxicology and in biological chemistry, so that we shall be prepared at least to begin to carry out laboratory work in those various directions. I conceived an organization with a base here in Boston, but with all the laboratory trained technicians throughout the state allied in one common object, that is, being prepared to assist the army service so far as may be. And I may say that if I am fortunate I hope to be transferred from the reserve corps into active service. So much, then, for the laboratory side.

It has occurred to me also that there might be another line of assistance that some of you might feel inclined to render, and perhaps Colonel Chamberlain will pardon me if I trespass upon a path of knowledge with which he is infinitely better familiar than I, and that is the question of the organization of hospitals. You have heard a great deal, in this community particularly, which has been especially active, I believe more active than any other in this country, of the organization of base hospitals, and I myself have been complimented by being asked to serve as the director of a possible base hospital. It had not occurred to me that that was necessary at the moment, and so far as that particular base hospital is concerned that has been given up. A base hospital is a very complete, complex and stable organization. Under service conditions its personnel numbers something in the neighborhood of 193 or 195—the commanding officer, the medical staff, the nurses and the orderlies. These base hospitals are more or less fixed in their stations. They are large units, requiring expensive outfits, and placed more or less permanently in situations at some little distance from the front.

There are, however, other, smaller organizations that it has occurred to me the enthusiasm of some of the local medical men might lead them to organize. These are designated under the name of Hospital Units and of Surgical Units.

A Hospital Unit is a much smaller organization than a base hospital. It consists of a director, with a medical personnel of 8, a nursing force of 25, and a comparatively small number of orderlies. And even more important, as it seems to me, just at present, is that the equipment of a hospital unit costs only about $3,000. Now, that is an organization that it is entirely possible to get up in small communities—comparatively small communities—at a comparatively small expense. All the members of the staff of the hospital unit must, like all the members of any other of these organizations, join the Officers' Reserve Corps. The use that would be made of such units by the War Department would be to transfer them rapidly to where they were needed in case of emergency, so that a Hospital Unit is not to be looked upon as fixed and more or less permanent in one place.

Then there is the still smaller surgical unit, so called. That is simpler still. It requires only four or five surgeons, who must enter the Officers' Reserve Corps, and a comparatively small number of nurses. These may be all skilled individuals. And here again is a body that will be transferred where essential to a new camp.

I was exceedingly interested the other day at receiving a letter from the surgeon general's office which closed with these words: "The crying need today is of members of the Officers' Reserve Corps, Medical Section, without a string to them." The need is, as Colonel Chamberlain has emphasized, of individuals who are ready to give their service, and to give it whereever they are needed, without waiting to have their own personal desires accomplished. And to my thinking, gentlemen, that is the essence of our need today everywhere, that we should all be ready to do our part and give our service without consultation as to our own personal desires.

Mr. Walter Maxwell of London, England, then addressed the meeting on the relation existing between this country and Great Britain and his own work in agriculture. A rising vote of thanks was accorded Mr. Maxwell at the close of his remarks.

The President. Gentlemen: We have listened to these remarks today from men who are best qualified to give them to us, and there is no doubt, as we separate here tonight and go to our various posts that whatever we do we should endeavor to carry out the lines that they have suggested, waiting for further orders, so to speak, if you want to call it that, which we may receive from Washington, if the plan which Doctor McLaughlin spoke of today materializes. Now, if there is anything that anybody wants to say don't be afraid to get on your feet and say it. If there are any questions you want to ask probably they may be answered by the speakers that are here today. We want to get all we can out of this meeting today, because we don't know what is going to happen, and with the organizations that are being formed in every community all over the state, as I said before all anxious to do the best and the most they can; when it comes to medical or hygienic questions you in your capacity should be the directors. They are bound to come to you. So if there are any doubts, if there are any questions, in your mind, don't be afraid to get up and ask questions, and see if we cannot in some way help you, so that when we all as a unit spread over this entire state and are working along certain definite lines one board or one health officer won't be working in one way and another in another and tearing asunder. We want to get together, because in union, you know, there is strength.

Mr. Kirschbaum. I would like to ask Doctor McLaughlin, if it is his intention or the purpose of this meeting in Washington to communicate with the various boards throughout the state, outlining what is expected of them.

Dr. McLaughlin. I will say, Mr. Chairman, in answer to that that the systems in the various states are so different that it is going to be a very difficult job, because of our peculiar form of government, to work out the exact manner of this coördination. In Massachusetts it will be comparatively simple; in other words, we will go on just as we are going, gentlemen. We have no trouble in Massachusetts about coöperation and coördination. It is not written in the law, as a matter of fact. Theoretically, perhaps, they might say our laws in Massachusetts were weak. Personally I have not found them so. I have not found the need of anything stronger in the way of binding together the local and the state health authorities. We have no trouble whatever. What the other states will do I don't know, but the first meeting in Washington will define just what the relations shall be between the state health authorities and the federal public health service, and there will also be provision made, probably, for a sanitary reserve corps. I don't think there is any question about that. I think that probably we will have to have in the states some kind of an emergency sanitary reserve corps. But those things you are quite right, Mr. Kirschbaum, will be threshed out in Washington, and after we get back the state health officers will have something more definite to go to our local authorities with and put before them, and I promise that that shall be done as soon as I get back.

Dr. Dionne. A few days ago I learned something that may be an explanation of the fact which Doctor McLaughlin mentioned a little while ago regarding the nurses. I believe that he somewhat complained of the great willingness of nurses to join the Red Cross and go to the front. I was talking with one of them, one who is about my age, not superannuated by any means, and who has already registered with the Red Cross and wants to go to the front. Finally I said, "Now nurse will your frankly tell me why you are so anxious to go there?" and she did answer frankly. She told me that it was because they generally had a proposal every pay day.

Now, gentlemen, regarding the possibilities of local boards of health, regarding the things that they can do toward preparedness I beg to mention what we have done in the town of Ware. Allow me to say that the Ware Board of Health, which I represent here today, owing to its peculiar composition, is perhaps better fitted than any other board in this representation to meet the ordinary war contingencies. It has a physician, it has also a plumber to look after the trenches and an undertaker to bury the dead. (That has been my association for the last few months, and I have got to stand it for the balance of the year. But we plan to live through it.) Notwithstanding this combination since the day that the war was declared we have been on the lookout. We did not even wait for authority from Doctor McLaughlin. Our water system, our reservoir, has been under constant guard. We have told the people that a culture of the typhoid bacilli thrown into that reservoir could do more harm than fifty guns, and they have placed it under guard. Our chief of police has arranged with the Otis Company (our largest plant), to place thirty-five additional lights around the premises, and we claim that that is one of the best ways to prevent foul play. Since the declaration of hostilities my car has been ornamented with a red cross beside the green one. Our chief of police knows that the car is fitted with everything that may be necessary to meet any possible accident, and that it can be called at any time, and may be boarded by any physician in emergency and if I cannot do any better than to drive it I will get there.

But now, in regard to the remarks that have been made concerning the sanitation of milk, etc., I will say that I have always been surprised at the conditions which are found in the country around a large number of farmhouses. We are progressive in the cities. We look after the milk. We look after the immediate milk supply being very particular about milk cans, milk depots, etc., but too little attention is given to the source of production. If you go to the farms you are apt to find there the same condition that prevailed a hundred years ago. You find the open privy vaults, the open sink drains; in other words, the human excretions are not controlled and they are made accessible to flies. And I ask you, gentlemen, in the occurrence of a case of typhoid fever what could you expect? We have had it. We had one time nineteen cases of typhoid fever which were traced to one particular case uncontrolled which occurred in the family of a milk man. It is my opinion that no man should be given a license for the production of milk for sale unless the privy vaults and sink drains on his premises are screened.

Dr. Laura Hughes. I rise in defense of the statement that Red Cross nurses always get a proposal on pay day. I am a member of the Nursing Service Committee of the American Red Cross for the City of Boston. I have been the chairman for a great many years. This last year I am not the chairman. And I want to comfort all the gentlemen with the knowledge that no nurse for the American Red Cross will go into service who is over 35 years of age. We have over 8,000 registered in the United States, and we have a very large number registered in Boston, so that we have enough to take care of all the home work, etc.

As one who has had considerable experience in disasters I do feel that I might add this little bit of an item, possibly, to the discussion today. During the Salem fire I had charge of the entire nursing system, and many times I have been asked: "What did you do with nurses during the Salem fire?" You perhaps know that we had 5,000 people living in tents, we had 500 children, we had 125 bottle fed infants, and without even one case of intestinal disease, because we had Red Cross nurses on duty from the very first morning. All sorts of persons have endeavored to claim the title of being the first there and taking charge of the nursing service, and all that sort of thing, until the Red Cross nurses arrived. I arrived first, with Miss Mabel Boardman, and the surgeon general put me in charge. We had Boston Red Cross nurses, people that I knew very well indeed, several of whom had worked with me before some of our Boston school nurses, who had special training in feeding were in the group but they were all Red Cross nurses, and who immediately began under the doctors to take charge of the infant feeding. In my opinion it is very much better to prevent disease than to cure it, and so we prevented intestinal disease in that particular place. That was one of the things. Then the nurses had charge entirely of the field hospital work under the Medical Corps of the M. V. M. Remember, there was no sewerage, there was no water, and all that sort of condition that goes with a disaster. And another thing that prevented disease was the very frequent, the four times a day inspection of the tents. I don't want to appear pedantic here, but few of you have had the opportunity that may possibly come to us. If our community gets into some kind of hysterics and the people all run out to Ware, or some such place, to live in tents for safety, one of the very best things to do is to have frequent inspection of those tents. Surgeons, under our splendid surgeon general, Dr. F. P. Williams, made an inspection every morning and evening with Red Cross nurses. Occasionally we found hysterics, as we did during the Spanish War; but after the morning inspection, with the surgeons and the nurses going round about, there were many little things that did not come to the attention of the surgeons, and that were not exposed to the surgeons. Again, during the forenoon I had these trained nurses making inspections of tents.

If you remember, the Salem fire was on a Thursday night, I think, and Friday morning we began our real work. The tents were up some time on Friday. The people really got into the tents on Friday and Saturday, and on Sunday afternoon we got the heels of 200 loaves of bread from under the pillows and under the mattresses and under the bed clothing. You will say, why did we bother with taking out 200 heels of bread; why not leave them there to feed those children? We felt that if the bread, and pieces of meat, etc., were allowed under the floors and the mattresses of the tents they would attract the field mice, and the field mice would carry bacteria from some other section of the community.

Then we had the military commanding officer, who was entirely ready to coöperate with us and who was looking for measles, a disease that always comes in camp life. We did not have measles, because we tried to prevent it and keep it out by preventive measures.

Again, in the afternoon, these nurses made another inspection, and the soiled clothing of these 125 babies was required by force sometimes to be taken out of the tents and down yonder to a place where the women were allowed to wash it.

The women were not allowed to eat in the tents. They could have all they wanted to eat, but one of the conditions—regarded by many as a great hardship—was that they were not allowed to stay in the tents and eat. They went to a large marquee tent, where they had all the good food they wanted, served army fashion,—good plain food. And that is, it seems to me, a very good suggestion.

Again we had no measles, besides not having the intestinal diseases; in fact, we had no epidemic whatever, and it was entirely due to preventive work. We were just as busy doing preventive work as other people would be curing measles and intestinal diseases, etc. I had experience during the Spanish War at Montauk Point with these terrible intestinal diseases, etc.

So I want to suggest if we should all run to Ware or some such place that we shall have these Red Cross nurses who are over 35 and therefore not eligible for the army active corps and that you medical men who are of course always in command will see that the nurses make these inspections, whether it is pay day or not. In that way we can prevent preventible diseases. I hope that we won't have any war, but in case we do, and we have a large number of people to inspect under canvas. I hope these ideas may help some to show what we did in Salem with 26 nurses and no sickness. The answer is that we prevented the sickness.

Dr. Dionne. My remarks have brought us a treat from this lady. I have been coming to these meetings for years, and I never heard a more interesting talk. But I beg to say in explanation that what I said could not concern the Red Cross in the least. It simply regarded certain people, of my age, who want to go to the front and give or dare not give their reason for it. As I am not a bachelor, I dare to tell you that I am fifty-four.

The President. In regard to the Red Cross nurses, gentlemen, I will say that all the nurses of the Boston Health Department a year ago joined it; but I have been led to believe that the Red Cross will not call upon any member of its association who is already connected with public health work in any way, shape, or manner.

Dr. McLaughlin. Might I say just a word before you adjourn? That is, gentlemen, that if in your respective communities you have not heard of a committee of public safety, or a sub-committee of that committee on hygiene, medicine and sanitation, you should ask questions and find out why such a thing is not in existence.

Dr. Hughes. I should like to ask Doctor McLaughlin if he does not think it is just the thing for an emergency to have in each community one of these medical committees, just to meet these groups of people that may get hysterics and run away from Boston to these other communities.

Is it not a good plan to have them all organized before we actually get there, so they will be ready for us?

Dr. McLaughlin. That is the idea, yes. On our program we have just the idea of having an emergency unit. That will be brought up and discussed.

Dr. David Brough. I should like to ask Colonel Chamberlain one question, and that is in regard to milk. With the troops in the camp is anything done to have milk pasteurized to prevent typhoid fever, or is there any way in which boards of health could coöperate with the military authorities in to see that the milk used is pasteurized to prevent infection?

Colonel Chamberlain. We do not require that the milk be pasteurized. In all camps of permanence and in military stations we have the milk examined from time to time, but of course to a large extent we have to depend upon the efforts of the health authorities in the vicinity, and in progressive states like Massachusetts I believe almost uniformly that the public supplies are safe. In view of the fact that our people are all adults the question of pasteurization I do not think is of so very great importance. The question of typhoid we have practically eliminated from the army now by reason of the typhoid inoculation. In 1898 we had in the army about 22,000 cases of typhoid, with approximately 2,100 deaths. That occurred for the most part due to infection received in the United States. Now, take the situation with our typhoid prophylactics. On the Mexican border last year we had approximately as many troops mobilized as we had in the Spanish War, and yet we had only 46 cases of typhoid and one death, that one death being in the person of a doctor. So I would not say that we would insist upon milk being pasteurized, but we would like to be assured that the supplies in the locality in which we get the milk have been tested by the usual means to determine that the milk is of good quality.

There was one more thing which I meant to say earlier, and that was with reference to the need of medical men both in the regular army and in the reserve corps. That need is very, very pressing, especially for young men for entrance into the regular service, men between 22 and 32, with a year's hospital experience. Such men can be of the greatest assistance to the army at the present time. If you will bring that to the attention of young men in your localities and urge them to consider the army service as a career, it will have good results. One of my duties in Boston is to help anyone who wishes to enter either the regular service or the medical reserve corps. I have an office in the medical school, where I am located part of the time, and the remainder of the time I am at Fort Banks. Either personally or by letter or by telephone I would be glad to offer advice and assistance to anyone who wishes to enter either the regular service or the reserve corps. I cannot too strongly urge you that you bring the matter to the attention of the medical men of suitable age and physical fitness in your localities.

The meeting then adjourned.

TUBERCULOSIS IN FRANCE

Dr. Hermann Biggs., *Commissioner of Health, New York State.*

An informal address before the Conference of State and Provincial Boards of Health at Washington, D. C., May 2, 1917.

Mr. Chairman and Members of the Conference:

ABOUT a year ago, the attention of the Rockefeller Foundation was brought to the extensive prevalence of tuberculosis among the French troops, and the Foundation was urged to take up the matter and have a study of the situation made. Accordingly, last summer, Professor Sabin, who is the Harvard exchange lecturer at the Sorbonne this year, was requested to make an investigation and report as to the situation. Dr. W. H. Welch of Baltimore also made a brief investigation at the request of the Foundation. As the result of this study of Professor Sabine, in the autumn, it was suggested that an International Tuberculosis Commission be appointed to visit France and all belligerent countries to determine what effect the war had had on the prevalence of this disease. On more careful consideration the trustees felt that sufficient information was not at hand to justify this action and asked me to go to France to study the conditions and report, with recommendations, to the Foundation.

In company with Dr. Dochez of the hospital of the Rockefeller Institute, and Mr. Winslow S. Pierce, a prominent lawyer of New York City, I visited England and France in January and February. We had the hearty coöperation of the French Government. Upon our arrival in France, Count Sagonzac, an attaché of the Foreign Office, called at our hotel and said he would be at our service to make all arrangements necessary to facilitate and expedite our investigation, and the War Department placed a military car at our disposal. The Minister of the Interior, who is the Director of Public Charities and Hygiene of France, gave us every assistance and opportunity to study the situation.

Briefly stated, the conditions are as follows: There has been a great increase in the prevalence of tuberculosis in all of the armies of the belligerent countries excepting only in England. England has suffered comparatively little.

All of the diseases which formerly have been scourges to armies in the field, viz.: typhoid fever, typhus fever, smallpox, cerebro-spinal meningitis, cholera, etc., have been brought under control quite readily, excepting at certain places and at certain times when well-recognized preventive measures were neglected, or were not put into effect, as in Servia in relation to typhus fever. In place of these epidemic diseases, tuberculosis has now come to play a large part, and in France the conditions are particularly unfortunate.

France mobilized a great army with great rapidity, and it was impossible, under the conditions prevailing, to make thorough physical examinations of the troops. The result was that very large numbers of cases of latent, incipient, or arrested tuberculosis were mobilized, and many of these developed active disease in the preliminary training camps, and still more developed the disease after being subjected to the hardships of life at the front.

We do not ordinarily think of armies in the field under the conditions which actually now obtain there. We think of them as living in tents, with plenty of sunlight and open air—the very best possible conditions—but under the conditions imposed by modern warfare as it exists in Europe today, we do not find these conditions at all. On the contrary, we find that the troops at the front live in the trenches, or in dug-outs under ground, still colder and wetter than the trenches. When they are not on the front lines they are billeted in peasant houses in the villages and towns near the front, or in out-buildings very much overcrowded with very little air or sunlight. There is a natural aversion to fresh air among the French people, and the result is that windows and doors are rarely opened, and we thus find ideal conditions for the development and dissemination of tuberculosis.

There is a very instructive sanitary lesson in connection with this. Before the war tuberculosis was very prevalent in France. Tuberculosis had never been officially recognized by the French authorities as a communicable disease. It had not been made a reportable disease. No great campaigns had ever been undertaken to instruct and educate the people on any public health question or on the prevention of tuberculosis. At the beginning of the war there were only about 1,000 sanatorium beds in the whole of France and these were entirely in private institutions. There were no hospitals or other facilities for the care of advanced cases. These cases were received in the general wards of the general hospitals, and cared for there, if cared for at all. There were no trained nurses or trained social service workers for visiting the homes and instructing those infected. The death-rate has been high from tuberculosis in France, about 3 per 1,000, 30 per 10,000, and in the cities it is much higher. In most of the cities from 3½ to 4, and in some more than 5 deaths per 1,000 occurred annually. When you contrast this with the situation in this country or England you realize how very unfortunate it was. The death-rate from tuberculosis in England is about 1 per 1,000 and in this country in the registration area about 1.4 per 1,000.

As a result of the conditions I have just described, there existed a wide dissemination of the disease in the civil population, and after mobilization many of these cases developed active disease and it was widely disseminated among the troops. At the end of 1915, 85,000 French soldiers had been returned to their homes with active tuberculosis. The enormous numbers of cases being returned aroused the French Government to provide some measures to meet the situation. It was impossible to provide hospitals for the institutional care of cases and they therefore, after much consideration, determined to deal with the problem primarily through the establishment of dispensaries. At the same time the French Government called upon the various departments (which correspond to our counties, there are about 85) to provide facilities so far as possible for the care of their own tubercular soldiers, and it further directed that soldiers discharged from the army with tuberculosis be received in these improvised stations, "stations sanitaire," and kept there for a period of three months.

During this period of three months they were to be instructed as to the nature of tuberculosis, its mode of communication, and the measures to be taken for its prevention, it being thought that in this way these cases, when returned to their homes, would be a less serious source of danger to their families.

They had up to January or February, 1917, provided in institutions of this sort about 10,000 beds. They hope, before the end of the year, to increase this number to 15,000. The French Government has, in the meantime, taken over all hospitals and sanatoria available for the care of tubercular soldiers, so that at the present time there is no place where a woman or child, or any person who has not been a member of the combatant forces, can be sent for treatment and care.

At the time we were in France it was estimated by the authorities (although no accurate data were available) that there had been about 150,000 cases of active tuberculous disease in the Army alone. Of course the number of beds available, 14,000 or 15,000, which they hope to have at the end of this year, scarcely touches the problem. They propose to establish dispensaries. A law was passed providing for the machinery for this purpose, and for the apportionment of the expense on the municipalities, the communes, the departments and the state, but the establishment of the dispensaries is voluntary on the part of the local authorities throughout the country.

There were about 4,250,000 people in the departments of France occupied by the Germans, and about 2,000,000 of these fled from their homes before the German invasion and are quartered, for the most part, in very unsanitary lodgings near the front, as near their original homes as possible, a large number being housed in Paris. The French Government, to protect these refugees, soon after the war began passed a law which prohibited the eviction of refugees for the nonpayment of rent, the purpose being to protect these refugees. The result of this law was exactly the opposite from what was intended because it made it impossible for the refugees to get good lodgings. Landlords realized that they would have to be cared for for the period of the war without compensation and they refused to give them lodging, or else gave them lodgings of the poorest type. These refugees are not only homeless, but are without resources, and are solely dependent upon relief organizations for their support.

You can understand, living in dark, crowded quarters, with very insufficient food, why the incidence of tuberculosis among them has been so great. It is impossible to say how great this incidence is, but it is very great.

About two and one-quarter million people remained back of the German lines, a part in their homes, a part in concentration camps and a part were deported by the Germans into Germany. Almost all, I think, between the ages of 15 and 45, both men and women, were deported to Germany. Many of these civilian prisoners, who became ill or a burden have been returned to France through Switzerland. At the time we were there, about a thousand a day were being returned and they were in the most deplorable possible condition. It was estimated by the French authorities that of the first 20,000 who were returned to France, nearly 5,000, or 25 per cent. were suffering from tuberculosis. They had been taken from their homes at the time of the first German invasion and many of them had never had their clothes changed from the time they were taken from their homes until they were returned seven or eight months later.

Of course it is impossible to know how many cases of tuberculosis there are among the civilian prisoners, but a very conservative estimate would probably be from 3 to 4 per cent. That probably is very low. That would give 150,000 or 175,000 more cases of tuberculosis which France has to deal with. Aside from these, there are in Germany about 350,000 or 400,000 prisoners of war. These prisoners of war have been living under the most unfavorable conditions possible; they are much crowded and with very insufficient food, subject to all kinds of hardships, and the sickness and death-rate among them has been very high. In the exchange of prisoners with Germany, we were informed of those coming back sometimes 30 to 40 per cent. were suffering from tuberculosis.

It is due to this fact that the statement was made and gained a good deal of currency, that the Germans had deliberately inoculated prisoners with tubercle bacilli. There is no evidence or proof of this. What happened is what one would expect to have happened under the conditions existing. The French soldiers had much tuberculosis among them—there was no attempt to separate the tuberculous from the well—they were all mingled together, under conditions particularly favorable for the spread of the disease, and at the same time of course they were very much undernourished. The result was that cases of the disease multiplied rapidly among them. Those returned are not to be regarded as a fair indication of the extent of tuberculosis of those remaining back of the German lines.

In talking with an attaché of the American Embassy at Berlin, whom I saw after Mr. Gerard and his party left there, he told me that he had been inspecting the French prison camps in Germany, and that, while there was a great deal of tuberculosis among the prisoners and no attempt had been made at the isolation of these cases, he did not see anything to indicate such a large incidence of the disease among them as had been claimed by the French authorities.

Aside from the cases in the groups of population referred to, we have the tuberculosis cases in the civil population which, of course, have not decreased in France since the war. The disease has undoubtedly increased there as in all of the countries at war, excepting Great Britain. Previous to the war there were in France annually about 100,000 deaths from various forms of tubercular disease. If we estimate the number of cases of tuberculosis there from the number of deaths occurring annually, we can get some idea of the number of cases in the civil population. In New York City, where we have about 9,000 deaths a year, we have reported annually about 22,000 new cases, and there have been as high as 30,000 to 35,000 cases under observation. If we estimate the cases in the civilian population for each death occurring annually, this would give us 200,000 cases. It would be a conservative estimate to say there are 150,000 cases in the civil population aside from those already accounted for.

Tuberculosis offers a problem of stupendous magnitude in France. If the war were to end now there would be between 400,000 and 500,000 cases of tuberculosis to be cared for, and practically no facilities to deal with them. France will have about 15,000 beds at the end of this year, and half a dozen well-organized dispensaries, and a somewhat larger number of poorly organized or very small dispensaries. They have only a few physicians at all familiar with the tuberculosis problem; they can almost be counted on the fingers of your hand; no trained nurses or social service workers. One may gain some idea of the situation as to the public health laboratory facilities and their utilization when advised that the year before the war, in 1913, in all of the public health laboratories in France, there were examined only 6,500 specimens of sputum. On the other hand in New York City, in a single year, there have been over 60,000. This gives you some idea of the contrast between the situation in France and the situation in some of our larger cities here.

Contrast with this the situation in England. England has a very efficient public health organization and administration. For many years this country has been very active in anti-tuberculosis work and the death-rate is lower than it is in any other great country in the world, about 1 per 1,000 of the population. The mobilization of the troops was done deliberately, special care was exercised in the examination of recruits,—a special physical examination and exclusion where there were any signs of disease. The result has been in England, instead of having tens of thousands of cases of tuberculosis, there have been only a few thousands, and yet England has mobilized an army of over 5,000,000 men.

The experience of England and France with reference to the prevalence of tuberculosis among the troops is one of the most instructive and encouraging exhibitions on an enormous scale of what public health activities, well-directed, will accomplish, and what heavy penalties the neglect of such activities, either in time of peace or war, involve.

Discussion.

Dr. Rankin, North Carolina: I would like to ask a question and that is, just what part the British Public Health Service or the English Service corresponding to our U. S. Public Health Service and our state organizations have taken with the British military organization. Have they gone in under the army or maintained in separate organization? You see the bearing my question has on the situation we are facing now.

Dr. Biggs, New York: The public health organization in Great Britain is somewhat different from ours. The whole of England is divided up into sanitary districts. Every district has a well-qualified public health officer, and, excepting in the smallest districts, this officer must have a diploma in public health. The general supervision of the health work of England is under the local government board, the president of the board being a member of the British cabinet. In Scotland, Ireland and Wales they have a similar organization. The local administration in each one of these is under the general supervision of the medical officer of the local government board of each country.

I don't know how active a part the local health officers have taken. In many cases they have been members of the Reserve Medical Corps—that is not the exact name, but it corresponds to that—who have not been called to the front, and in this capacity they have taken part in the sanitary supervision of the troops.

The President: Gentlemen, I think that if we did not get anything else from Dr. Biggs, the information he has given us in a few minutes, pays us for our trip here, and I suggest a rising vote of thanks for the information given us.

A rising vote of thanks was thereupon extended to Dr. Biggs.

Dr. McCormack, Kentucky: I would like to move that the President and Secretary extend to the Rockefeller Foundation the great admiration of this Conference for the work they propose to do for our allies in France.

Dr. McCormack's motion was adopted.

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National Certified Milk Contest.—The National Certified Milk Contest held at Brooklyn, N. Y., June 1 to 4, 1917, in connection with the eleventh annual meeting of the American Association of Medical Milk Commissions, was interesting in many ways.

Twenty-one entries were received from a like number of dairies supplying milk to cities in different parts of the United States. The milk was eight days old when examined and despite this, two-thirds of all of these entries of raw milk had bacterial counts of less than one thousand per cc.

The average score of all entries was over ninety-five points out of a possible one hundred.

Milk from the certified dairies of Arthur Meeker, Lake Forest, Ill., Wilco Farms, Willisville, Ill. and J. D. Farrell, Renton, Wash., each received a total score of 97.5 points. Each tied for first place in the National Certified Milk contest. As the bacterial counts were minus 100, 200 and 400 per cc. respectively, Arthur Meeker was awarded the first prize, Wilco Farms the second prize and J. D. Farrell the third prize.

In speaking of this contest too much can hardly be said regarding the shipment of Certified Milk received from Seattle, Wash. This milk from five farms, which after traveling for seven days, a distance of over three thousand miles, upon examination was found to average 96.8 points out of a possible one hundred.

The chemical and bacteriologic work was done in the laboratory of Dr. Harris Moak of the Kings County Medical Milk Commission by J. A. Gamble, Market Milk Specialist of the United States Department of Agriculture, detailed for the contest.

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THE WAR AND THE VENEREAL PROBLEM.

Every thinking sanitarian realizes that one of the great problems of the war will be the prevention of the venereal infections among troops and industrial forces. That this cannot be accomplished by any single means is equally apparent. Given a group of diseases which are limited to human beings, which are essentially chronic; which are spread by a contact usually having as its basis the strongest of human desires and it is seen that rigorous measures along diverse lines will be necessary to prevent and eradicate it. The problem is essentially that of a chronic-carrier, contact disease. If all cases which are in the infectious stage are apprehended on enlistment and if separation from chronic carriers, *i. e.*, infected persons, is absolute, the disease group will cease to exist. It is in effect a quarantine, a breaking of the cycle of infection. The cure of all chronic carriers would also break the cycle but this is manifestly impossible; the prevention of the sale of alcoholic beverages will help enormously but cannot be relied upon absolutely; the application of moral force by sex-education will bring about a certain degree of self-restraint but only in a small percentage of cases; absolute continence would control the disease group except in those unusual cases in which the infection is spread through other varieties of contact. Evidently then, the therapeutic attack should not be diminished, and the spread of knowledge regarding the venereal diseases should be unchecked. The only sure method against these infections, however, is continence, and in the case of men under discipline, it is publicly enforced continence, in other words the quarantining of the susceptible individual against the prostitute. This is a civil measure. Military authority will control the military zone itself. It should not in addition be obliged to handle the matter in civilian communities. Congress has, however, empowered the Secretary of War to do so if in his judgment it is necessary. This much overworked individual and the Medical

Corps of the Army should if possible be spared this burden—as a matter of fact, the civilian health officer with the backing of the police power of the state is in a much better position to administer this problem. More than this, if he will take active and energetic steps to control prostitution,—and this is the one dependable measure,—he will not only be doing a patriotic service to the fighting arm of the government but to the productive civilian population as well. Not only is it imperative that an attempt be made to control prostitution among those who ply their trade openly,—it is even more important that clandestine operatives be removed from the zone in contiguity to troops. Butte (*Bul. de l'Acadde Med.*, 1, LXXVII, 7, 13 Feb. '17, p. 210) reports that of 10,000 such persons examined, 2,655 presented venereal disease, and over five hundred of these were syphilitic. The venereal problem is an epidemiological one and does not differ in any essential particular from the other contact infections in which chronic carriers occur, therefore the indifference which many health officers have displayed to this question in the past is the more inexcusable particularly in the face of a war in which the maintenance of the military health is so essential.

THE TUBERCULOSIS COMMISSION FOR FRANCE.

Readers of the JOURNAL will be interested in the following extracts from an editorial from the *Journal of the Outdoor Life* for July, as it concerns Dr. Livingston Farrand, for some years editor of this JOURNAL and Treasurer of the American Public Health Association:

> Probably the most distinct compliment the campaign against tuberculosis in the United States has ever received has been the recent appointment by the Rockefeller Foundation of Dr. Livingston Farrand and a party of associates as a special commission to France for the purpose of establishing there an anti-tuberculosis movement modeled after our work in this country. To have chosen a man of the ability and experience of Dr. Farrand, who was the genius of the first nine years of tuberculosis organization work in the United States, is an added compliment and reflects honor not only on Dr. Farrand personally, but upon all of those who have labored to make the tuberculosis movement of this country a success.
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> More than a year ago, when the Duc De Richelieu came to this country as a special envoy from the French Government to study the anti-tuberculosis movement here, we began to learn something of the problem of tuberculosis in the French armies. A result of the reports of the Duc and others was the sending of Dr. Hermann M. Biggs, State Commissioner of Health of New York, to France to look over the ground and to make a report of conditions as he found them.* The picture that Dr. Biggs has presented in his several public addresses and reports culminating in his recent paper before the Annual Meeting of the National Association, is one that is even more alarming than that given to us by the Duc De Richelieu and more awful in its future possibilities for sapping the vitality of the French nation than any one in this country had previously realized.
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> With more than 150,000 soldiers already discharged from the French armies, with an appalling incidence of tuberculosis in the devastated and war-ridden regions of northern France; with an even greater incidence of this disease among French refugees and prisoners who are coming back into their native country from exile in Germany and Switzerland; and with a very high normal death-rate even before the war in the entire French population, the figure that Dr. Biggs gives us of between 400,000 and 500,000 cases of tuberculosis at the present moment in France is one that is truly enormous. It would seem as if the plague of tuberculosis will threaten to sap the very life-blood of the French people after the war unless very drastic measures are taken now to control it.
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> As Dr. Biggs has also well pointed out, the plight in which France finds herself today because of tuberculosis is due almost entirely to her failure to recognize this disease as a serious problem during the years before the war started and to take precautions against it. It will be the herculean task of Dr. Farrand and his associates to begin at the bottom and to organize in France the voluntary and public effort that will secure for the nation institutional, dispensary and nursing care and that will provide educational facilities to safeguard and instruct the people concerning the ravages of tuberculosis. Fortunately, France has the experience of the United States and other countries to build upon. If the results obtained in this country shall prove helpful to our sister republic and ally across the seas, the investment of time, money and personal sacrifice in this country will be amplified many, many fold.

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* An article on this subject by Dr. Biggs appears elsewhere in this issue.

OBSERVATIONS AND EXPERIMENTS ON DISHWASHING*

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SO FAR as we know there has been no investigation on dishwashing as performed in public restaurants. That dishes are possible vehicles for disease transmission is recognized in the laws against common drinking cups and in the practice of sterilizing dishes used by patients suffering from infectious diseases. Although the latter practice is almost universal and although it is well known that sometimes persons in apparently good health discharge infectious material from the mouth, no attempt has been made to determine to what extent such material may be transmitted to patrons of restaurants using common dishes. It was decided, therefore, to inspect a representative number of restaurants in New York City, and to test out experimentally the efficiency of the methods in use.

Restaurants can be grouped on the basis of dishwashing, into two classes: (1) those using the hand method of dishwashing, comprising by far the larger number, and (2) those using mechanical apparatus.

Dishwashing by Hand Method.

Twenty-two of the establishments visited used the hand method of dishwashing. These included both cheap and highclass restaurants.

Inspections.—The glasses used at the drinking fountains of the average quick lunch restaurant are not washed at all. Usually, there are a dozen or more glasses on a shelf above the water faucet, which, after use are rinsed off and placed upside down to drain. These glasses are not washed, and are therefore, little better than poorly rinsed common drinking cups.

The practice relative to the cleaning of glasses in confectionery stores is poor. Glasses after use are rinsed off and used again without drying them for serving soda water to a second patron. The spoons are shaken around in water and stood in metal containers from which, although frequently wet, they are served to the next patron.

Although in the restaurants of this group there is considerable variation in the care exercised to produce clean dishes, the process is substantially the same in all places. The dishes are placed in large dish pans containing warm soap water, are rubbed with a dish cloth and then removed to another dish pan containing warm water for the purpose of rinsing off the soap. They are next removed to a draining board and then dried with a towel. In several of the establishments the dishes are not dried with towels, being allowed to dry in the air, the waiter rubbing them with a napkin to remove noticeable spots before

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* Received for publication, December 22, 1916.

placing them on the table. The temperature of the dishwater was, in every case, below 45° C. This is unavoidable because the dishwasher must constantly introduce his hand into the water.

Bacterial Data.—Bacterial counts were made from samples of dishwater and from moist sterilized swabs rubbed over cups, spoons, forks, etc. As expected, the counts fluctuated greatly. Naturally, if dishes upon which there had been milk were washed, the dishwater counts would be high; if, on the other hand, the water were changed at the beginning of the inspection, as frequently happened, the counts would be low. Consequently no conclusion on the care exercised in washing dishes can be reached from the bacterial counts obtained either from the dishes or the dishwater. The counts obtained, however, are included below for comparison with those obtained from the water of the mechanical dishwasher to be described later. Although no definite conclusion as to the efficiency of the hand method of dishwashing is advanced as a result of study of the bacterial data, we should like to draw attention to the large number of high counts obtained from dishwater and from swabs of spoons and cups.

BACTERIAL COUNTS—HAND DISHWASHING.

Dishwater—per cc. on agar (24 hrs.).

No. of bacteria.	*No. of places.*
Between 1–100	1
Between 1000–50,000	5
Between 50,000–100,000	1
Between 100,000–300,000	6
Between 300,000–500,000	4
Above 500,000	1
Not taken	4
Swabs from spoons.	
Between 1–100	8
Between 100–1,000	6
Between 1,000–50,000	3
Above 50,000	3
Not taken	2
Swabs from rims of cups.	
Between 1–100	4
Between 100–1,000	5
Between 1,000–5,000	11
Over 50,000	2

Tests on Manual Dishwashing.—Since little information can be obtained from direct examination of dishes and dishwater, series of tests were conducted for the purpose of observing the reduction in the bacterial counts of dishes artificially infected and subsequently washed in a restaurant. Sets of dishes were smeared with bacteria suspended in salt solution, in broth, and in egg albumen. These bacterial suspensions were left to dry on the dishes before the latter were washed. The bacterial suspensions were made up from a salt solution suspension of an agar slant of Bacillus pyocyaneous. Equal quantities of the suspension of bacillus pyocyaneous were added to tubes containing 10 cc. of salt solution, 10 cc. of broth and 10 cc. of egg albumen. The dishes were smeared with equal quantities of these suspensions so that, in a measure, the reductions due to washing would be comparable. The dishes after being washed in the kitchen of a clean lunch room were returned to the laboratory. The surfaces were carefully rubbed with sterilized moist swabs and the washings plated out in agar.

While the cleansing of the dishes was, no doubt, unusually thorough, since the object of the experiment was known by the dishwasher, the reduction effected by the hand washing was even much greater than we expected. The counts were as follows:

Controls.	
Non-infected (sterilized) plates (6) Count, between 0–2	Infected plates not washed (6) Total count 500,000 to 700,000 B. pyoc.

After Washing.		
Dishes infected from salt sol. B. pyoc. (12) Total count, between 50–80	Dishes infected from broth—B. pyoc. (12) Total count, between 100–150	Dishes infected from egg albumen—B. pyoc. (12) Total count, between 100–180

Tests were made on the possible bacteriocidal effect of the soap powder used, by suspending bacillus pyocyaneous in solutions of the powder prepared similarly to those used in the restaurant. No material reduction in the bacterial counts was effected. The soap, however, had a high deturgent value in removing bacteria previously dried on Petri dishes.

The experiment above indicates that careful washing of dishes by the hand method, especially if soap is used, is highly efficient, even though the bacteria had been dried on from the suspensions of salt solution broth, or egg albumen. It should be remembered, however, that the washing of these dishes was far more carefully carried out than is usually the case. Although the above experiment would tend to foster confidence in manual dishwashing, our inspections convinced us that this method is highly unsatisfactory. The dishwater is not changed frequently enough, the dishes are insufficiently rinsed, and soiled towels are used for drying. Flies were observed in contact with the empty dishes even after they had been washed; flies were observed also in contact with the dish towels. During the busy lunch hour, in large restaurants, where several hundred persons are served, dishes must be cleaned rapidly for immediate use. Cleanliness is too frequently sacrificed for speed. If hand washing were carefully performed, we believe it possible to obtain satisfactory results. On the other hand, we think it very difficult to enforce care in the washing of dishes by hand.

MECHANICAL WASHERS.

Inspections. — Six establishments using mechanical apparatus for dishwashing were inspected. The apparatus for this purpose varies somewhat, but substantially the following description will answer for all. The dishes are packed in wire crates of proper size to be lowered into a vessel containing boiling soap water. At the bottom of the vessel containing the boiling soap water is a fan attached to an electric motor; when the fan revolves, the water is violently agitated and the dishes thereby thoroughly washed. After exposure to the boiling water for about one minute, the crate is transferred to another vessel containing clean boiling running water. Here the dishes are raised and lowered several times and then transferred to a drying board, where they are stood on edge to dry in the air. The dishes are so hot that hand drying is not necessary and thus considerable manual labor is saved. Furthermore, this operation is very rapid, one man being able to accomplish the work of several, and at the same time getting much better results. The appearance of the dishes is far better after this process than after the hand washing process; there are no grease marks on the dishes, which now have a clean shiny appearance.

Bacterial Data.—The temperature of water in the dishwater in all cases but one (where it was 70° C.) was at or slightly under 100° C. By referring back it will be seen that the temperature of the water in the hand washing process never exceeded 45° C. and was indeed usually under 40° C. The bacterial counts of the water from the mechanical washer were consistently low, never exceeding 10 per cc. The counts obtained from the spoons and the rims of cups ranged below 50. In one case only did the count exceed 500. These figures offer a striking contrast to those obtained from hand washing tests.

Tests on Mechanical Washer.—Series of plates similar to those prepared for testing hand washing, were passed through a mechanical washer. The results can be briefly stated: The test organism (B. pyocyaneous) could not be recovered from any of the dishes. When bottles were used in place of dishes, however, the organisms could be obtained from the bottom of the bottles in greatly diminished numbers in only three cases out of twenty. No doubt, the bacteria were protected from the water by air pockets.

Since infected material from the mouth of one person would hardly be transferred to the mouth of another from the bottom of deep receptacles (*e. g.* cups), we believe the occasional recovery of a small percentage of the organisms from the bottom of deep receptacles to be no objection to the general application of mechanical apparatus for dishwashing. The knives, forks and spoons tested, were either sterile or gave very low counts.

The time of exposure and the temperature of the water were sufficient to kill all non-spore-bearing organisms.

SUMMARY.

HAND WASHING. *Inspection.*—1. The glasses in restaurants and confectionery stores are merely rinsed off and therefore not properly cleansed. Paper cups should be used unless the glasses can be washed with soap in hot water. The spoons should be similarly treated or scalded.

2. The amount of care exercised to obtain clean dishes fluctuates greatly; dirty dishwater and towels are used in many places, and soiled and greasy dishes served to patrons. Flies were observed on the empty dishes even after the dishes had been washed. Flies were also seen in contact with the dish-towels.

Bacterial Data.—1. The temperature of the dishwater was not sufficiently high to effect bacterial reduction, the cleansing of dishes resulting largely from the deturgent action of soap.

2. Dishes and dishwater frequently gave high bacterial counts.

3. Artificially infected dishes,

washed in a restaurant were cleansed, largely as a result of the deturgent action of soap combined with the vigorous rubbing with a dishcloth. The bacterial reduction exceeded 99 per cent.

The hand washing of dishes, while capable of producing excellent results, is too often carelessly performed.

MECHANICAL WASHING. *Inspection.*—1. Dishes washed in mechanical apparatus have a clean, glistening appearance.

2. No hand drying is necessary.

3. It is a labor-saving device.

Bacterial Data.—1. Except when bacteria are in the bottom of bottles or deep containers, and protected from the boiling water by air pockets, the dishes are nearly always sterilized.

2. Test on dishwater and counts from swab washings from dishes indicated that the temperature of the water, and the time of exposure were sufficient to produce nearly sterilized dishes.

CONCLUSION.*

In view of the carelessness in washing eating utensils in many of the poorer class of restaurants and confectionery stores and in view of the possible transmission of disease from this source, and furthermore, because of the desirability of producing clean and glistening dishes, we recommend an ordinance requiring the subjecting of all eating utensils in public places to a temperature exceeding 80° C. for one minute before permitting the serving of such utensils to a second person.

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*Since writing this paper a similar conclusion has been reached by Dr. H. N. Cole (*Jour. A. M. A.* Vol. XLVII, No. 25, p. 1805) as a result of a study of the etiology of a number of cases of extra genital chancres. Doctor Cole writes: "There should be stringent laws enforced by careful inspection, requiring the placing of all dishes, glassware and silverware in boiling water for the space of five minutes, even if the microscopic dust be not removed. This would effectively kill all organisms and fully protect us."

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The Physician and the Food Supply.—An editorial in the June, 1917, issue of the *Southern Medical Journal* discusses the physician's rôle in handling this important war problem:

The principal danger lies in the meat shortage. The Department of Agriculture announces that there is available at this time 100,000,000 pounds less meat than a year ago. The wheat, corn, and sugar crops, to a less extent, are predicted to yield much less than last year.

We are informed that the average man would be more efficient and that he would live longer if he ate less of meat, flour bread and sweets.

It is believed that the medical profession should be organized in a campaign of education that would give every person in the nation accurate information as to just how much he should eat of the different kinds of foods. The people of the United States should be taught that it is not only their patriotic duty to eat less, but that they will be healthier and more efficient if they will restrict their diet. Obviously this does not apply to persons who are under-nourished, but such an educational campaign would at the same time tend to correct this condition by instructing the people in the proper amounts of proteins, carbohydrates and fats that should be eaten.

The article concludes that by such action the physicians will have a wonderful part in conserving the present food supply; and in the years to come we may expect to see a reduction in the mortality from nephritis, heart and arterial diseases that have been so rapidly increasing during the last thirty years.

THE ENFORCEMENT OF REGISTRATION OF BIRTHS AND DEATHS IN METROPOLITAN AREAS—HISTORY, METHODS, RESULTS AND CHECKS.

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Director of Records, New York City Department of Health.

Read before the Section on Vital Statistics of the American Public Health Association, Cincinnati, Ohio, October 24, 1916.

IN LOOKING back at the experience of a few of the large cities of the United States as to the registration of births and deaths, there stands out prominently the fact that the medical man has been no better in his observance of the laws than the ordinary common garden variety of man, and it was and is the fact today that if you spare the rod you will spoil the child's registration of its birth and that a rod in pickle must ever be ready to punish the medical attendant who fails to do his duty by his patient and her offspring and by the community.

The four cities of Boston, Providence, Philadelphia and New York may be taken to illustrate the title.

Of the four, Boston seems in the past to have more consistently enforced the law as to registration than any of the other cities. The volumes in the city registrar's office testify to the fact that, as early as 1630, births and deaths were entered therein and that a continuous file has been kept to date; of course the completeness of the registration in these early days is open to grave doubt. Providence began to register deaths about the year 1840 and births about the year 1855. Philadelphia possessed registration laws as early as 1818 but apparently there was only a lax enforcement thereof and in 1860 the health officer congratulated the city on the passage of a new registration law which was to be enforced strictly with the end in view of at last obtaining a fairly complete compliance with the act.

The best criterion of the comparative standing of the four cities that I could make was to calculate the birth-rates for the year 1855 for the cities of Boston, Providence and New York and for the year 1861 for Philadelphia.

The rate for Boston was 37 per 1,000, Providence 34, New York 22 and Philadelphia 30, so that, assuming the age constitution and fecundity of the population of the cities to be approximately the same, Boston would carry off the palm for the most complete registration with Providence, Philadelphia and New York in the order named.

Undoubtedly within the last half century there has been a complete compliance in the cities named with the laws relative to filing of certificates of deaths. The checks placed upon disposal of the remains of deceased persons without the issuance of a permit consist chiefly in forbidding carriers to transport remains, cemetery keepers to bury remains or crematory superintendents to burn remains unless a permit accompanies the body in each and every instance. Persons in charge of cemeteries and crematories are also compelled to return permits to the official who issued them in order that they may be compared with the certificates of death on file.

The complete registration of deaths was not attained in the city of New York until March of the year 1866, in which year when the Board of Health was organized. Previous to this date, the official charged with the enforcement of the law was the city inspector under the control of the board of aldermen, who had charge of what was called the Bureau of City Inspection, whose duties consisted not only in enforcement of the law relative to filing of death and birth certificates, but also in carrying out the ordinances of the board of aldermen appertaining to nuisances of all descriptions, such as bone boiling, street cleaning, piggeries, night soil, slaughter houses, etc.

It is safe to assume that a system then in use which allowed the undertakers of the city to possess and to issue burial permits upon certificates of death given to them by the physicians in last attendance upon the deceased was not likely to result in complete registration at the office of the city inspector. Undertakers would misplace, lose and forget to file the certificates entrusted to their care, so that the death-rates based upon these inadequate returns were undoubtedly erroneous and failed to reflect accurately the mortality of the years previous to 1866.

With the organization of a board of health clothed with autocratic powers in matters pertaining to health and the consequent operation of a code of sanitary regulations, the complete registrations of all deaths occurring in the city was obtained by the forbidding of the disposal of the remains of human beings, without a permit issued therefor by the Department of Health. The records of deaths from 1804 to 1865 inscribed in large towns came into the possession of the registrar of the Department and though admittedly incomplete are still treasured as evidence of the status of medical science in those early days. Page after page of these volumes give mute testimony of the unscientific terms used, such as hives, flux, cramps, debility and weakness.

The very earliest record of deaths is a list of names of persons who died from yellow fever in the year 1789, one of the names having as an addendum "this girl refused to take her medicines." Another early record gives an account of the death of Alexander Hamilton as a result of the duel with Aaron Burr.

REGISTRATION OF BIRTHS IN NEW YORK CITY.

The first law bearing upon this important phase of public health service was passed by the state legislature in 1847, but curiously enough carried no penalty for violation of its letter and spirit, with the consequence that during the years 1847 and 1848 only a few hundred births were recorded. During the following years, no attempt at all was made either to amend the law by providing for the punishment of offenders or to enforce the existing inadequate statute, so that few births were registered until the year 1853 when a penalty was provided and from July 1, 1853, births were registered but at no time until recent years was the law consistently and vigorously enforced. It is true that sporadic attempts were made by well-meaning officials to instil into the minds and memories of the physicians and midwives the necessity of compliance with the statute but these attempts were short-lived and nugatory in results.

The best evidence that can be produced as to the incompleteness of our birth records is the inability of the registrar at the present day to furnish to hundreds, yes, even thousands, of applicants transcripts of their birth certificates.

In 1902, a determined effort was made to punish a physician for failure to file a certificate of birth. The lower court decided that the physician in question complied with law as he swore that he had mailed the certificate though his recollection of the circumstances surrounding the mailing of the certificate was decidedly hazy. The case was appealed and by a vote of three to two the Appellate Division of the Supreme Court upheld the decision of the lower court. In 1903 the law was amended compelling the physician or midwife to *file* a certificate of birth, the law before amendment reading that the medical attendant must *report* all births occurring in his or her practice. Then came a change of administration and for six years no physician was prosecuted for violation of the statute.

In 1910, a change again having occurred in administrative circles, steps were immediately taken to discover and punish delinquents. Within two years over two hundred physicians and a dozen midwives were fined from $10 to $100 each. No one escaped unless he or she was able to prove physical or mental infirmity. Not over six pleaded illness as an excuse. Every individual complained about was given an opportunity to present his excuses before prosecution was begun. Some of the excuses offered bordered on the humorous, one physician claimed exemption because he gave the certificate to his wife to mail, another that he never sent in birth certificates as he was never asked to, one that his office boy instead of buying postage stamps and affixing them to the envelopes, bought candy.

The excellent example set by the layman at the head of the department in 1910 to 1913 was followed strictly by the two physicians who have occupied the office in 1914, 1915 and 1916.

Efforts to Discover Examples of Violations.

First: The comparison of the index of deaths of all children under one year of age with the current birth index and that of the previous year. This means is open to all but has the drawback that it uncovers only a small percentage of violations.

Second: The securing of the names, places (street and number) and dates of birth of all infants under one year of age and the name and address of the attending physician by the nurses in their routine visits to the homes in their districts; the list thus obtained is compared with the birth indices and violations thus discovered. It may be stated in passing that two indices of births are maintained in the office of the registrar, one a name index, the other a house and number index, to make sure that the medical attendant may not have an unjust accusation brought against him; this double index is very necessary as in a city like New York there is such a diversity of nationalities with consequent unspellable names that difficulty is experienced in locating the record by using the name index alone.

Third: In past years recourse was had to paid advertisements of birth and local society items to ascertain if the births stated therein were recorded at the department.

Fourth: Mothers applying for milk at the milk stations bring their babies with them, so that this departmental activity may be utilized to perfect registration.

CHECKS TO ASCERTAIN PROPORTION OF BIRTHS FILED.

First: The best check that I know of has been, and is, the comparison of the list of names of children under one year of age as obtained by the nurses of the Department in their routine visits, with the name and the street indexes of births. As a result of a test made one year ago in which over one thousand names of children were used as a basis, the percentage of registration in the various boroughs was as follows: Manhattan, 99.6; Bronx, 100; Brooklyn, 96; Queens, 95; Richmond, 94; City, 98.

Second: One of the assistant registrars started several years ago to keep an account with each physician, showing how many births were filed during the current month, and in the event of absence of reports from any of the physicians, he was queried over the 'phone as to his failure to file the certificates. The consequence was that each physician practicing in that borough became aware that he was being checked up as it were, and soon contracted the habit of strict compliance with the law. This borough showed 100 per cent. registration.

Third: Since January 1, 1916, a third check, though an indirect one, has been put into operation. The number of births reported during 1915 was 141,256, and the question of sending a certificate or statement of birth to the mother was taken up in that year and discussed, but the cost of sending such statement to a large number of parents was so large it was deemed best to postpone the sending of these certificates until January 1, 1916, the present commissioner finding the wherewithal to do it. The receipt of this statement by the parents results in its exhibition to the neighbors, so that in the advent of a baby in the family of the neighbor the certificate of birth issued by the Department of Health is looked for and if not received, inquiry is made at the Department why it was not sent. Since January 1 about a dozen personal inquiries have been made as to why no statement was received by the family. In each case, except one which later served as basis for a prosecution, the certificate of birth was on file but by reason of wrong address, the certified statement was not delivered. Apropos of birth statements issued to parents, I desire to call your attention to the artistic certificate issued by the registrar of Spokane, Wash.

PROCEDURES WHICH HAVE HELPED TO ATTAIN AN ALMOST COMPLETE REGISTRATION OF BIRTHS IN NEW YORK CITY.

First: The compulsory presentation of a certificate of birth from the Department of Health before admission into the public schools. This procedure adopted in 1904 has been carried out to the present day with the result that almost all mothers in the city are alive to the necessity of having the baby's birth recorded.

Second: The compulsory furnishing of a certificate of birth from the Department of Health in order to obtain an employment certificate.

Third: The most important factor in obtaining accurate and timely reports of birth is the adoption of a policy of punishing the violator of the law; this policy is strictly adhered to at the present time, and any physician or midwife who violates the law realizes that no influence, political, social, medical or otherwise will prevent the imposition of a fine for his or her delinquency.

The law governing these cases makes it a misdemeanor to fail to file a certificate of birth within ten days. At no time has the Department of Health encouraged the institution of criminal proceedings; it is found that the beginning of civil action brings home to the offender the fact that the Department means business; he or she thereupon calls at the Department and for a first offence is allowed to confess judgment and pay a penalty of $10; a second offence calls for a heavier fine of about $25, and a third offence—only one in six years, calls for a fine of from $50 to $100.

My advice to registrars who fail to secure approximately complete registration is "Go thou and do likewise."

THE USE OF VITAL STATISTICS IN EPIDEMIOLOGICAL STUDIES.

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Epidemiologist, United States Public Health Service.

Read at the meeting of the Section on Vital Statistics, American Public Health Association, October 24, 1916, Cincinnati, Ohio.

THE basis of all epidemiological observations is essentially statistical. Observations which are not capable of quantitative expression are seldom worthy of consideration in a serious epidemiological study. The success or failure of any such study rests, usually, only upon the accuracy and completeness of the observations on which it is based. The development of the science of epidemiology, therefore, is dependent upon the accumulation of information regarding the prevalence of disease, which is at once accurate, complete and easily available

Epidemiological observations may be broadly divided into two classes: first, intensive observations, made upon relatively small numbers of cases but comprising many items of information, collected with great precision and accuracy from the original source of the data; and, second, extensive observations, usually comprising only a few items of information regarding each case, but made upon large numbers of cases, and applicable to large units of population.

Intensive studies are usually made under the direct supervision of the investigator, and the information is usually collected directly from the patient and his immediate environment. With such information, the registration official has usually but little to do.

For extensive information, on the other hand, the epidemiologist must usually depend upon the results of the labors of the organized health agencies of the country. Voluntary reports, answers to questionnaires and other forms of report collected privately are seldom sufficiently accurate or extensive to be of real value. The true basis of all extensive epidemiological studies is to be found in the mortality and morbidity statistics collected by the registration officials of the United States. Since the original sources of this information are scattered over the various states and comprise millions of individual items, the available sources of information for such studies are in actual practice limited to the published reports of the various cities and states, and to the reports of the United States Census.

Up to comparatively recent years, the volume of this material was very limited, and the area covered exceedingly small. The rapidly extending area in which death registration is accepted by the Census and the increasing interest in the registration of morbidity, promise much for the future. In this connection the sanitary world is under profound obligations to the founder and first chairman of this Section, to whose monumental labors practically all the progress of the United States in vital statistics is due.

The time is apparently not far distant when the vital statistics of the United States will be sufficiently complete, extensive and accurate for all practical purposes. There remains for discussion only the methods of tabulation and presentation of the demographic material which is being accumulated so rapidly.

The value of demographic material for epidemiological studies varies almost directly with the minuteness with which the figures are subdivided and cross-tabulated according to the three primary tabulations of location, chronology and age. These three facts regarding each case or death are of primary importance. The secondary facts of color, sex, nativity and occupation are occasionally of value, but for most statistical studies only the three primary facts are necessary.

A statement of the total number of deaths from typhoid fever in the United States, for example, for a period of ten years is of little value statistically. A statement by single years allows comparisons between years and shows the general trend of the disease. A statement by states by years is of greater value still, while a statement by states by months shows certain important facts regarding the seasonal differences in typhoid prevalence. Further subdivided by cities and counties, and stated by months, the information attains still greater value. The age distribution of typhoid deaths for the United States, likewise is of but little interest. By states the information is valuable, by cities and counties still more so.

The information desired by the epidemiologist, therefore, in reference to typhoid fever, would be a tabulation, showing for each significant geographic subdivision, the number of cases and deaths from typhoid fever, arranged by months, and by age periods. Similar tabulations for the other diseases of public health importance would yield a great mine of information regarding facts at which we at present dimly guess.

Geographic subdivisions used in such tabulations should, of course, be coincident with areas for which population and age distribution statistics are available. In this connection it seems very desirable that there be some change in statistical practice in certain states in reference to areas included in population units. In certain states, particularly in New England, the town, for which population statistics are available, consists of a relatively small area of urban territory and a large surrounding territory in which the population lives under rural conditions. This is not a satisfactory unit for any sanitary statistical study, since the two sets of conditions included in the unit are not comparable, and since the city, as it really exists, cannot be separated either in area, population, or morbidity and mortality.

A further reform which seems desirable, is the preparation and publication of intercensal estimates of population by age groups. At present we have, for the census year, figures for total population, and mortality at all ages, and in addition we have the age distribution of the population and of the mortality. For intercensal years, however, we have estimates of total population, and deaths at all ages and by age periods. We do not have, however, any official estimates of population by age periods, for use in computing rates.

The work of this section in the standardization of tabulations and the establishment of uniform age periods for statistical purposes has been of great value. For certain statistical purposes, however, the publication of mortality by single years of life would be of great value, in permitting comparison with other reports in which age periods different from those of the standard practice have been used. This may not be possible, however, for all reports, but should be kept in mind in the publication of detailed studies of particular interest.

The publication of vital statistics in such detail is, of course, an expensive proposition, but when one considers the enormous cost of collecting such statistics, the additional outlay necessary to properly tabulate and publish them is not a very large item. Vital statistics have sufficient legal and general importance to justify their collection and registration, but their value to the sanitarian is dependent altogether on the way in which they are tabulated and presented

A study of published reports of mortality and morbidity would seem to indicate that the editors of most reports either had but hazy ideas as to the statistical uses of such reports, or did not think it worth while to take such uses into account. The total number of deaths from any given cause of death is frequently subdivided according to geographical divisions, and frequently according to color, sex and age, but only infrequently according to months, and seldom or never are important causes cross-indexed by months, age and civil divisions.

It must be borne in mind, of course, that the smaller the civil division to which statistics relate, the greater the possibilities for subdivision. There is no reason why in a city or county report, a single table with causes of death in the vertical column, months, color, sex, and age periods in the horizontal columns, should not show practically everything needed for the epidemiologist.

In state reports, the difficulty of presenting the figures in sufficient detail increases with the number of civil divisions included. Either a separate table for each civil division reported, prepared as described for the cities, must be presented, or the important diseases must be treated in separate tables. The Census report in such a case would be a combination of state reports, together with additional summary tables for the registration area as a whole.

Whatever the solution of the difficulty, some change in present methods of presentation is imperatively necessary. To study the prevalence of typhoid fever in the cities of New England, for example, necessitates the compilation of tables showing the number of deaths, by months and age periods, for the several cities. At present this can be obtained only by a visit to each state capitol, a search of the original records, and in many cases the review and classification of hundreds of thousands of certificates. The labor involved makes the compilation of such a table, showing only the simplest and most elementary facts regarding the prevalence of typhoid in the oldest of the registration states, almost impossible.

An additional difficulty confronting the epidemiologist seeking accurate statistical material is the marked discrepancies existing between local and state reports on the one hand and state and federal reports on the other. It would seem that with the methods of classification at present in use, discrepancies should be rare, and that some system of exchanging classifications and correcting differences could be devised.

In conclusion, therefore, it may be said that from the standpoint of the epidemiologist, the amount of statistical material available in this country and its accuracy and completeness are matters for congratulation. The form in which this material is published, however, is far from satisfactory, and it is to be hoped that the same energy which has resulted in so great an expansion of registration in America, will be turned to the proper tabulation and publication for the available material, so that all that we have may be readily accessible, and that the cause of sanitation may be advanced by the joint labors of the registrar and the epidemiologist.

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Climate and Tuberculosis.—"The consumptive who contemplates going to a distance in search of a favorable climate must consider the advantages and disadvantages, how much good the better climate will do, and what he forfeits in making the change—whether the gains compensate for the losses."

Thus writes John W. Trask, assistant surgeon general, United States Public Health Service, in an article appearing in the *Journal of the Outdoor Life* for June, 1917.

Doctor Trask considers that the conditions which make a climate good or bad are: The temperature and humidity of the air, the frequency and velocity of winds, and the presence or absence of dust and smoke.

Too many times, other things of equal or greater importance are sacrificed to the matter of climate.

The summary of this excellent article is quoted in full.

"A favorable climate for a consumptive is one that is not too warm. A moderately cool atmosphere is invigorating, while a too warm one is depressing. Very cold weather, on the other hand, makes the living of an outdoor life more difficult and less attractive. Moderately cool atmospheric conditions are those to be sought.

"No locality has a climate that is favorable all the year, and most localities in the United States have favorable climates for a considerable portion of the year if one will only take advantage of them.

"In one's quest for a favorable climate one must not forfeit suitable food, rest and peace of mind, or gain a more favorable atmosphere in which to live at the price of homesickness and worry.

"The consumptive can usually obtain the most favorable conditions for recovery, including an outdoor life, suitable food, rest, medical attention, and nursing, at or near his home. A suitable atmosphere or climate can be obtained during many hours of the day by avoiding overheated or crowded rooms and by sleeping on a porch in all ordinary weather and in a room with open windows when it is very cold or stormy.

"Leaving home, except to go to a sanatorium, is fraught with much danger, unless one is financially able to meet all possible demands, and it should be most carefully considered even then."

THE MODERN HYGIENE OF TYPHUS FEVER—ITS APPLICATION AT THE PORT OF NEW YORK.

JOHN R. HICKS, M. D.,
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SINCE Hippocrates used the Greek word "Typhus" which signifies "smoke" and intended its use to signify stupor, there has been a great change in the hygiene of this disease. In the eighteenth century de Sauvages gave it the name of putrid or pestilential fever; other names were hospital fever, ship fever, spotted fever, jail fever, camp fever, and exanthematic fever. This has been one of the great epidemic diseases of the world; but thanks to modern hygiene, the blotted pages which tell of its ravages upon mankind during war, pestilence and famine are a closed book.

Typhus fever may be defined as an acute infectious disease of known origin, characterized by sudden onset, maculohemorrhagic rash with or without marked nervous manifestations, and terminating by crisis about the end of the second week. Sporadic forms of this fever occur and, until recently, often offered great difficulties in diagnosis, but by recent experiments many obscure cases of fever which were formerly called Brill's disease have been definitely proven to be typhus fever.

By careful experimental study it has been demonstrated that this disease is a typical germ disease and the organism is conveyed by the bite of lice, hence this disease is associated with filth and overcrowding. It is just what one might expect, as it is easier for vermin to travel short distances than long ones. Again it was looked upon as a most contagious disease and those in attendance were formerly invariably attacked. In a period of about twenty-four years in Ireland among 1,230 physicians attached to institutions, 550 died of this disease. The observations of Littlejohn are of interest in this connection. He noticed that comparatively close association with the patient was necessary and during a recent outbreak in large overcrowded tenements where many families occupied different rooms in the same flat, the fever did not spread from one family to another unless individuals were in the habit of going into each other's rooms; persons who were not on intimate terms with the infected ones (although these rooms opened on the same narrow, badly-ventilated landing and the occupants probably passed each other daily) escaped infection.

In Edinburgh it was customary to nurse patients with typhus and typhoid fever in the same ward; the typhus patients were put in one end of the ward near the fireplace so that the lice could be kept warm and would stay by their fireside, while the typhoid patients were put on the cold side near the door where cold drafts would prevent the migration of the pediculicapitis, pubis, and vestimenti.

I am inclined to reverse the general medical belief that males and females are affected equally. In our twenty cases all were males, but the number of cases were too few to arrive at any definite statistical conclusions. In regard to age: in our list of over 3,000 contacts there were 200 children under twelve years of age and none had the disease or were taken with it after arrival. Nor were any of the children sick in any other way, so there could be no mistake as to diagnosis. If this is true it would be interesting to know why children are not susceptible and what is the nature of their antigens. If one could see the large number of pediculi in the heads of children in quarantine, one could not help believing there must be some immunity of one kind or another. Now that the germ of the disease has most probably been discovered these points should soon be decided. From January 7, 1914, to June 19, 1914, the Health Officer's Department treated twenty true cases of typhus fever and kept under observation for a period of twelve to fourteen days approximately 3,000 contact detentions, including 200 children under twelve years of age. Of these, two cases developed within two or three days after the arrival at the detention hospital from the infected ship. As soon as the diagnosis was made these cases were sent to the isolation hospital for care and treatment, while the detentions were kept for the full period of incubation without development of any other cases. Out of conditions of filth and ignorance comes knowledge and simplicity of hygienic methods which when properly applied cost little or nothing and are absolutely efficient against this pestilential disease.

Practical experiment has demonstrated that petroleum oil (ordinary "kerosene" such as is used for illuminating purposes) is the cheapest vermicide that can be used as well as one of the most efficient, and I believe too little attention has been paid to it as a germicide. If one will take a house-fly (Musca domestica) or other form of fly, place him between two layers of absorbent cotton, and drop a drop of petroleum (refined) on the insect he will die almost instantly. The same is true of all forms of the pulex, pediculus, ascarus, cimex lectularius or other parasitic insect.

Based upon this fact, a system of personal hygiene for all typhus contact immigrants, was introduced which, I believe, is of interest and worth describing in detail. Sulphur was found to be too superficial in its effects even if burned in the proportion of eight pounds to the 1,000 cubic feet; owing to the large amount of material to be disinfected steam is and must be used wherever possible. We have tried numerous experiments to determine the efficiency of steam under pressure and the relative efficiency of SO_2 as vermin destroyers. Pediculi were placed in the sleeve of an old shirt and wrapped with three double blankets, then tied with twine into a tight bundle and subjected to live steam at fifteen to eighteen pounds pressure for varying lengths of time. The vermin were found destroyed in every case after thirty minutes' exposure but were not killed after twenty minutes, so considering the varied number and kinds of bundles of goods to be disinfected, a time limit of forty minutes exposure to steam under fifteen pounds pressure was adopted as a standard. In regard to sulphur dioxid a record of one experiment will be sufficient. After burning over seventy pounds of sulphur in 8,000 cubic feet of air space for eighteen hours, live pediculi were seen crawling on the white colors exposed to infection. This having been observed we took a number of woolen garments and placed pediculi in the folds and covered them with one layer of cloth, then put them in a small chamber of about 200 cubic feet and burned nine pounds of sulphur for fifteen hours, at the end of which the pediculi were still alive.

Consequently for the prevention of the spread of typhus fever the following procedure was put into effect and has proved most satisfactory. On arrival of the typhus contacts they are made to march in line to the concrete court and each one is given an open mesh bag (cotton, 24″ x 30″) into which all cloths, cotton and woolen goods of all kinds from their valises or trunks are put, and their valises, trunks and other articles, shoes, hats, etc., are transferred to a large sulphur chamber to be disinfected over night with eight pounds of sulphur to 1,000 cubic feet. The mesh bag and its contents are then taken by the immigrants to a large room. Here immigrants are lined up and undressed and their clothes are put in these bags. A metal tag with the number is pinned on the bag and a rubber tag number is put around the neck of each patient corresponding to the bag tag. His money and all other valuables are taken away and dipped in a solution of fifty per cent. alcohol and put in an envelope with his number written plainly on it. After being stripped and made to pass from this large room through a passage into the shower-bath-room where they are given a preliminary bath (using soft soap and hot water), they are given a petroleum bath, about six ounces being used to the patient to destroy all vermin. After this bath they are dried with a towel, given pajamas and slippers and fed. Clothes are disinfected by steam under pressure, dried "in vacuo" and returned to the owner, after which the latter are removed to a clean dormitory.

A clean dormitory is one that has been swept, each bed and floor washed with 1-20 carbolic or petroleum. While peculiar conditions governing our service keep us from employing petroleum for the purpose of washing down walls and cleaning floors, I believe it is a preferable method. By the method I have outlined more than one hundred persons an hour can be sanitated. It is plain that this method is efficacious as in the great number of detentions held at quarantine, there was not a single secondary case developed after the expiration of the period of incubation, dating that period from the time of sanitation.

THE PRESENT STATUS OF AND NECESSITY FOR MOUTH HYGIENE.

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Read before the General Sessions, American Public Health Association, Cincinnati, Ohio, October 27, 1916.

AT THE time of writing, so far as the essayist could obtain information, this will be the only paper on mouth hygiene delivered before the present session of the American Health Association. This is not in accordance with the importance of the subject, and it is manifestly impossible to embody in one discussion the many sides of this topic. The plea is here made that at your next conference more time and attention be devoted to the educational propaganda of oral hygiene. It is just as necessary to the physician, dentist, public health worker and bacteriologist as to the layman.

In a recent issue of *The Outlook* there appeared an article, "Diseased Teeth and Bad Health," by Matthias Nicoli, Jr., M. D., New York State Department of Health, from which I quote: "Happily, the medical profession is at last coming to realize that the field of dentistry is not isolated and independent but touches at many points the field of general medicine and surgery. It has been found imperative that physicians and surgeons possess at least a theoretical knowledge of disease-breeding conditions met with in the teeth and jaws, but it is even more important for the dentist to appreciate the close relationship between his profession and that of the physician, surgeon, bacteriologist, chemist and public health official."

When articles of this sort are presented to the layman, it is high time that we, as professional men, realize the importance of the subject. Why, at so late a date, it is still necessary to make appeals for the proper care of the mouth and teeth is almost beyond comprehension. Would that it were possible to bring to the attention of every educator the need for a dental inspection in any school and more particularly in a poor district. For even all educators are not alive to the connection between mouth-health and mental efficiency. Several years since, an "experimental dental class" was formed in Cincinnati. Two classes of the same grade in the same school were selected—one known as the "experimental" and the other as the "control." A series of tests (physical, psychological, as to the home environment, social status, etc.) was instituted for both classes. Then the mouths of the children composing the experimental class were put in first-class condition and the mouth hygiene of the class was constantly supervised. At the end of the school term the tests before mentioned were repeated. The results are on record. Suffice it to say here that the average of the experimental class was 85+ per cent. and that of the control 69+ per cent. These figures were provided by the school principal.

It has been frequently stated that 90 per cent. of the school children of the United States require dental attention. Do you realize what this means? Insufficient mastication, the swallowing of pus and other germs, filth that a street-cleaning department would shy at, toothaches, to keep the child awake at night and to interfere with his regular duties in the daytime. In short, unclean mouths induce every condition that the trained worker of today is trying to prevent or to combat.

There are three great social diseases: Tuberculosis, sexual diseases and decay of the teeth. In each of these, preventive measures are the only really effective ones. What does it matter if you can induce the tuberculosis patient to sleep outside, take proper food and be cured if the environment in which he lives remains the same and he returns to his former occupation and habits? So with this movement. Parents and children must be instructed through the medium of lectures, demonstrations, exhibits and all the means which it is scarcely necessary to enumerate before a gathering of this type. The follow-up work must be immediate and thorough. Last year in Cincinnati a mouth hygiene educational week was attempted. Lectures were delivered in every school in the city, public meetings were held before improvement societies, parents' clubs and mothers' clubs; a special teachers' meeting was arranged at which prominent speakers appeared. At the end of the campaign it was stated that practically every child in the city owned a toothbrush. But what is the state of affairs today? The follow-up work was not what it should have been and the "intensive campaign" was blamed where the "follow-up" was really responsible.

Probably at no time since the inception of the oral hygiene movement does there seem more reason for active preventive measures than at present. It has been conclusively shown that local foci of infection produce systemic disturbances which are most difficult and sometimes impossible to eradicate. Under this head may be mentioned various forms of rheumatism, arthritis, heart disease, stomach and intestinal disorders, etc.

Probably the main cause of this local infection is from so-called "dead" (pulpless) teeth. There is no method known to modern dentistry whereby the nerve of a tooth may be extracted, the pulp canal filled in such a manner that infections do not follow, except through a tedious technical procedure which requires a minimum of three hours and the highest of technical skill. Therefore, this condition must be avoided and it can only be done through preventive measures, that is through persistent, sanitary procedure so that the teeth will not decay. Where they do, they must be attended to before the cavities are so deep that it becomes necessary to "treat" the tooth.

Authorities, such as Hunter of England, Rosenau, Billings, Hartsel, Price and others too numerous to mention have called attention to this fact and it is high time that the hygienist should sit up and take notice.

The congestion of population in cities is more and more making it necessary that special sanitary precautions be pursued to prevent conditions which are so difficult that our corrective work is growing beyond us. All the arguments that are used to show the necessity for proper housing conditions and proper living to prevent such diseases as tuberculosis apply to our work. It is no uncommon thing in this day to have a special dental department in hospitals, which is expensive and is always more or less inadequate. If our health authorities and social institutions would coöperate in this preventive idea, we might ward off an ever increasing expense.

Not only, however, does this situation exist in the large communities, but it has reached the farm, and the educational propaganda must be extended into the rural communities at the same time. It is a well-known fact that many an immigrant lands upon the shores of the "promised land" with an excellent masticating apparatus which is changed to a disease-breeding bacteria-propagating plant inside of two years. Why can we not reach this element before it is too late? We must teach them to eat the proper foods, exercise and stimulate the tissues of the mouth and teeth so that the new citizens shall become useful and independent producers

What is the position of the oral hygiene movement in the United States today? Unfortunately I cannot give you all the information as to what the various communities are doing but the larger efforts can be mentioned. We will divide them into the following headings:

1. Special institutions for the treatment of children's mouths.
2. School clinics
3. Educational propaganda.
4. Clinics in hospitals.
5. Clinics in commercial plants.

1. Special Institutions for the Treatmen of Children's Mouths.—The Forsyth Dental Infirmary, of Boston, is the only one of this group which is in operation. This institution has an endowment of two million dollars and a magnificent plant situated on the Fenway in Boston. They have facilities for handling about 400 children per day. Operating rooms are provided for nose and throat diseases, a special school for the teaching of orthodonthia (straightening of the teeth), a research department, halls for lecture purposes, etc.

In Rochester, N Y., Mr. Eastman, of Kodak fame, has given about $1,500,000 for an institution somewhat along the same lines with this exception—he stipulates that the city of Rochester provide $25,000 per year for five years to do the work in the schools and they are also providing for clinics outside of the main institution. There is more or less difference of opinion as to the relative values of centralized clinics as opposed to the clinic in the public school. Your essayist inclines towards the latter, for, as these institutions attempt to reach the very poor, it would seem that the closer they are to the homes of the people the more likely are they to be used, to say nothing of the savings of carfare and time to the patients. Besides, there is the moral effect which the institution close to home supplies. Rochester, N. Y., has probably the oldest oral hygiene movement in the United States and it is most gratifying that the efforts of those pioneers have been recognized in so substantial a manner.

2. School Clinics.—In almost every instance school clinics have been instituted through volunteer effort on the part of dental organizations or small groups of dentists. After the clinics' efficiency has been demonstrated, the city boards of health have taken them over. Detroit has made most progress in this direction, its appropriation now being $20,000 per year. Cincinnati, Cleveland, Philadelphia, New York, Toledo, etc., have effective organizations.

While only a few of the most prominent efforts have been mentioned, it is gratifying to report that in hundreds of small communities clinics are being operated through volunteer service; also that in many of the larger centers, either through professional or volunteer service, a start has been made in this direction.

The so-called prophylaxis method has been advocated and is being employed particularly in Bridgeport, Conn. After they have had one year's training, school nurses clean the mouths of all the school children. This is done at regular intervals and it is claimed by the advocates of this system that more can be accomplished in this manner through preventive, rather than by remedial measures.

3. Educational Propaganda.—Cincinnati's work may be taken as typical, but it should be said here and now that not one of the large communities is providing sufficient treatment for its citizens. With us, the Board of Health is paying the salaries of most of the employees. What the city cannot afford to do at the present time is being done by a social agency maintained by the dental organization. The clinics are located in schools situated in those districts from which most of the patients are drawn. Dental inspections, an important part of the work, are made by volunteers under an effective system developed in the eight years of the endeavor. Lectures in the public schools are delivered by these same volunteers and a constant propaganda is maintained through their efforts. As a result of this propaganda, several correctional institutions are supplying dental service to their inmates.

4. Clinics n Hospitals.—The advanced medical man has recognized that the modern hospital is not complete without its dental department and it is no uncommon occurrence to find a well-equipped dental clinic there. Our new City Hospital has made excellent provision for handling this end of the work. Our Tuberculosis Sanatorium has one dentist in regular attendance and is requesting more service. So it is wherever you turn. Nor is it surprising this should be so. Once the work is started—once it is given a fair chance to show what can be accomplished through its ministrations—the need for continuing it is seen. In some hospitals clinics are maintained for out-patients as well as for those under treatment in the wards. This is very necessary; for most of the free dental work, so far, has been done for the children and the adult without means has been left to shift for himself. The consequence is either that he neglects himself or that he falls to the tender mercies of the advertiser. The latter is usually unscrupulous and his work can be depended on to match his seemingly low prices.

5. Clinics in Commercial Plants.—Probably one of the most encouraging results of our propaganda has been the recognition accorded by the business man. He is beginning to see that a dental clinic in his plant is an investment, not a liability. The Metropolitan Life Insurance Company of New York, the Akron Rubber Company, the Colgate Company, The Cincinnati Milling Machine Company and others are now operating their own clinics. The statistics when compiled are likely to prove interesting reading. They will show the condition existing among the employees at the time of the opening of the clinic and to what extent their efficiency may be augmented through proper dental interference.

In the Cincinnati Milling Machine Company the examination of 600 employees showed the following:

350 had never consulted a dentist.
216 had not consulted in over a year.
47 had consulted within six months.
86 had consulted within three months.

The last figures have probably been induced through examination. Approximately one half of the men had insanitary mouths; in one fourth of the cases conditions were fair, in one fourth good. The masticating efficiency of one fourth was bad. One thousand four hundred and twenty teeth required filling—an average of over two and one half to an individual. Pus was present in more than one half of the mouths, from one cause or another. This is a startling state of affairs. Does it not stand to reason that after these men are relieved from pain and given a chance to chew their food so that normal digestion may follow, their labor will be better in quality and greater in quantity?

Experiments have been made for the purpose of proving that delinquency, retardedness, feeble-mindedness, etc., are concomitant with insanitary mouth conditions. Operations for the removal of tonsils and adenoids are not as effective if the mouth has not first been put in a sanitary condition. We require the thorough coöperation of every agency concerned in the health movement if we are to arrive at the point where we are no longer compelled to admit that "90 per cent. of the school children of the United States require dental interference." If 90 per cent. of the children are in this condition, how about the adults? At an examination held at the Cincinnati Tuberculosis Hospital several years ago the conditions discovered were positively deplorable. Those inmates whose mouths were not absolutely filthy or where pus was not present, had insufficient masticating ability. Over half the patients admitted that they never used a toothbrush!

For many years there was a controversy between the dental and the medical professions as to the status of the former. Fortunately, the mother-profession has awakened to the importance of our movement and is according to us the place by her side to which we are entitled. The dentist is coming to be recognized more and more as an essential part of an army's medical corps. Enlisting stations have turned away man after man because of the would-be recruit's defective teeth which would render him unfit for the best service and dentists are kept at the front to maintain there men who would otherwise have to be sent behind the lines for relief from dental disorders.

One of the lessons of the great war is the intimate relationship of medicine and dentistry. In the American Ambulance Hospital at Paris a regular corps of dentists is on duty. Among them is a steady supply of American volunteers. Some of the most remarkable surgical work has been developed in that dental infirmary—work which only expert dentists could perform.

Let us open our minds to conditions as they are. Let us all work together to awaken the public from its lethargy. Let us do more preventing; then we shall have less curing to undertake.

A perfectly clean tooth cannot decay. Who will help to show this very simple truth to the world?

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Fighting the Venereal Quack.—It has long been recognized that the best way to fight the venereal quack is to take away his advertising. Some years ago *The Chicago Tribune* declared and waged successful war on these gentry.

In a contribution to *Health News* (New York State) for May, 1917, William T. Foster tells of the work of the Oregon Social Hygiene Society during the past five years. Scores of cases of the abuses of the fake "doctors" were called to the attention of selected groups of mothers, teachers, physicians, commercial clubs, etc.

"The culmination of the campaign appears to have been a meeting of the Retail Merchants Association, at which the members were told that it was not good business to pay for honest advertising which had to compete in the daily papers with the dishonest claims of quacks. They applauded vigorously; but they were assured that the newspapers could not hear their applause. They were urged to act at once. Two days later, in February, 1912, every fake doctor advertisement disappeared from two of the leading papers of Portland and soon from all the other papers.

"Public sentiment was ready for a sweeping law. It was passed at the next session of the legislature. Since then it has been unlawful for any person to print or distribute in any manner the kind of advertisements to which we objected."

"The effectiveness of this phase of our program became evident at once. Our field agents, after watching at the doors of medical institutes, reported that their business was rapidly falling off. We soon had the satisfaction of exhibiting photographs of three-fourths of the largest establishments showing "For Rent" signs in the windows. Most of these concerns sought more comfortable and more remunerative existences in other states. From the point of view of these states, this migration will hardly prove a blessing, unless it prompts them all to action. The whole nation should drive this particular tribe of fakers to jail or to honest labor."

MONTHLY SCHEDULE FOR HEALTH OFFICERS.

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Presented before the Section on Health Administration, American Public Health Association, Cincinnati, Ohio, October 25, 1916.

THE work of a health officer is either routine, emergency, seasonal or opportune. The division into these classes is evident. The seasonal activities are those which adapt themselves to previous planning and these, except in the presence of an epidemic, constitute a large proportion of his work. They are the factors of prevention, not those of control.

Since it is human nature not to anticipate dangers, there is a frequent tendency for district health officers, and those of small towns, to await developments rather than to institute active sanitary improvements when most needed. The too-frequent abiding of time is due to the lack of study of future calendar months, their needs and opportunities. Fly and mosquito extermination, infant welfare work, disease control, and all the other sanitation campaigns should begin when most timely and effective, without waiting until the enemy has made a marked advance in his campaign. Some medical practitioners and laymen serving as health officers do not realize the need of instituting sanitary activities at definite times. They do not commence to compile their reports until obliged to do so. For this reason it is an advantage to present to the country health officers and to the sanitary authorities of the smaller towns a seasonal list of public health activities and opportunities.

Where county or district health officers are furnished with a monthly schedule of seasonal health activities, the state department has better information of what particular work may be engaging the extra time of the local men in the field. If the health officers are working along corresponding lines, their work and results are more comparable.

It is for these purposes as a means to have the various enumerated activities begun at the designated times that the following seasonal schedule is presented, in the belief that at these months is the work most needed, most economical, most beneficial and most opportune.

MONTHLY PROGRAM FOR HEALTH OFFICERS.

January—Compile and publish annual report. Make physical examinations of school children.

February—Track up disease contacts. Plan and execute educational campaign.

March—Control diseases. Examine school children.

April—Institute semi-annual clean-up. Clean privy vaults. Begin dairy farm inspection. Begin movement to improve sewage and garbage disposal methods. Institute fly campaign; destroy breeding places, order manure boxes.

May—Inspect alleys and lots, garbage and rubbish piles. Investigate sources of water supplies. Inspect rural schools for sanitation. Inspect creameries, cheese factories, slaughter houses. Follow up discharged tuberculosis cases. Investigate summer resorts for sanitation and disease carriers.

June—Hold Baby Week; establish baby clinics. Get visiting nurse for infant welfare work. Begin mosquito campaign. Attend annual conference of state health officers.

July—Make rural investigations of typhoid, hookworm disease, trachoma. Inspect summer resorts in operation, picnic grounds and camps. Inspect sanitation of transportation companies.

August—Prepare health exhibit for fairs, schools, etc. Continue July program.

September—Hold health exhibits at county fairs. Collect data on sanitary improvements made at schools, etc. Inspect canning factories. Inspect school children for contagious diseases.

October—Begin examination of school children for physical defects. Institute rigid control over every case of contagious disease. Track up disease contacts, instruct and control them. Institute semi-annual clean-up.

November—Hold public health meeting in county medical society. Investigate water purification and sewage treatment plants. Follow up discharged tuberculosis cases. Develop factory hygiene.

December—Investigate jails, asylums, public buildings and theatres. Check up vital statistics records, births and deaths. Attend meeting of the American Public Health Association.

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STAMMERING IN CONNECTION WITH MILITARY SERVICE.

Ernest Tompkins, M. E.,
Los Angeles, California.

WAR is gradually awakening us from our peaceful commercialism, and we are unearthing evidences of unpreparedness of which we never before had any suspicion. Problems in connection with military and naval service with which European nations have wrestled for years now become problems for us. Men will be called to defend the country and many of them will have to be rejected on account of incapacities, among which stammering is of considerable importance.

According to the best available figures there are approximately 1,000,000 stammerers in the United States. Of course not all of these are of military age—notably the 300,000 in the schools; but of the adults approximately nine-tenths are males, so a considerable number of men otherwise fit for duty will have to be rejected on account of stammering, a number large enough to give the enlistment officers considerable anxiety, if the experience of European nations is a criterion. Doctor Chervin's elaborate examination of French enlistment statistics showed the rejection of seventy-five men out of 10,000 on account of stammering; but that rejection was based principally on the inability of the candidate to ask and give the countersign, a test which allows many stammerers to pass. The uninitiated might think that the reduction in enlistment is represented by those who fail to pass the test; and apparently that is so, for the slight stammerers are mustered in. But the fact is that many of those slight stammerers who enter the service and advance in it, often to high rank, may at any time become absolutely incapacitated by intensification of the disorder. Doctor Chervin cites the case of an officer whose slight stammering had not incapacitated him until one day when marching his men toward a ditch the idea occurred to him that he would not be able to give the command to halt, and the idea was realized, for he was barely able to stop them at the edge of the ditch by an inarticulate cry. The record does not say whether this officer was incapacitated after that experience, but he probably was; for such an experience so intensifies the trouble that the utterance of any order might be an impossibility. However it was with this officer, it is certainly so in quantities of recorded cases. Rudolf Denhardt cites many cases of officers incapacitated by similar experiences. The loss to the service of a trained officer who has become useful in it is considerable. Yet many such losses must inevitably occur under present conditions. But can anything be done to remedy those conditions? Yes. The entire disorder can be extirpated within a few years. Its existence at the present time is one of the saddest indictments of the human race that history has to record. All this will be evident from consideration of the nature of the disorder.

Why could not the officer call "Halt" to his men? Simply because his fear of inability to issue the order prompted a frightened misdirected effort which blocked his normal speech. If the fear had not arisen in his mind he would have issued the order properly. Some time in his childhood an accident or incident had induced him to make a conscious effort to help his speech; but after speech is acquired it can not be directed consciously, so his effort hindered his speech and planted the fear of speech disability. But that fear was slight and did not induce enough continued interference with his speech to bother him much—a degree of stammering that is sometimes called "sleeping stammering" because it is inactive. Its awakening under circumstances of deep humiliation undoubtedly kept it awake—and very much so—for the rest of the man's life.

This explanation of stammering will undoubtedly be rejected by many authorities. They are not agreed as to what they think stammering is, but they seem to be almost a unit in rejecting what it really is. However, the truth needs only time for justification. Moreover, the extirpation of stammering is entirely independent of what it is. Call it anything you like; the remedy is indisputable, and has been known vaguely for thousands of years. All that is needed is to know it clearly and to apply it.

The remedy is readily deducible by a little analysis of the outgrowth of stammering. For the few who question the outgrowth of stammering it may be said that German statistics show that at least two-thirds of the stammering school girls are free from the trouble in adult life; and scientific considerations, taken in connection with these statistics, indicate that of the girl babies who contract stammering, nine-tenths recover before middle age. Moreover, every community contains several fluent adults who were once stammering boys. Examination shows that these recovered stammerers had done much spontaneous talking. Stammering is intermittent; the stammerer's speech consists of correct talking done spontaneously and incorrect talking done when he is frightened. When he does much spontaneous talking, and finds himself talking freely, the idea of disability fades. The general expression of the remedy is, the prevalence of correct talking over incorrect talking. No other remedy is known. The three-weeks alleged cures are principally temporary uplifts due not to the methods used, for they are generally harmful, but to the calmness and confidence instilled by the environment of the cure, as is demonstrated by the relapses away from the cure.

The time of real correction—the removal of the idea of speech disability by correct talking—is inversely proportional to the rate at which that talking is done; doubling the rate of talking halves the time. The time of recovery is also inversely proportional to the age at which it is begun. At the inception of the disorder it can be stopped in no time; in old age it is generally considered incurable, but that is a mistaken impression due to the fact that the disorder is more tenacious than the application of the remedy. The mother's remedy, prohibition of stammering, is hastened outgrowth. The prohibition of stammering is equivalent to a great increase in the rate of correct talking. This method is wonderfully efficacious in the period between the acquisition of stammering and the beginning of schooling (stammering is generally acquired before schooling begins). The little girl stammerer is generally corrected then; but the boy stammerer runs out where he is ridiculed instead of corrected, so his chances of recovery are relatively slight. This throws an interesting light on the very existence of stammering; its existence depends on the unkindness of human nature. Why will a stammerer almost go into a convulsion at times to say something? Simply because his experience has taught him that he will be considered queer if he does not talk like other people so he persists in his efforts to talk like them. An enlightened public will remove that impression and show him that he is not expected to say what he fears to say, but may calm himself and speak, or make signs or write or remain silent. Moreover, they should require him not to make any effort in speaking. The disorder is contagious, and it should be suppressed for the protection of non-stammering children, not to mention the recovery of the stammerer himself.

What are we doing to remedy stammering now? We are making it worse. The timid stammering child, which has probably been outgrowing its trouble, is put into the school and subjected to the cruel punishment of the oral recitation, by which his affliction is intensified and confirmed. While we are beginning to train the school boys for the defense of the nation we are coincidently incapacitating a considerable number of them. The reversal of that policy should be as quick as its inconsistency is evident. The oral recitation for stammering children should be at once abolished and stammering should be prohibited on school property. This will gradually eliminate the disorder. Parents may help by relieving the stammering child of required talking and by prohibiting stammering in the home; but even without the aid of parents, the rational school treatment will undoubtedly accomplish the desired result.

The special treatment of the adult stammerer is of course beyond public control, except for declining to listen to him when he stammers. The impression that such treatment is heartless is only one of the many mistaken popular impressions—one of that big class that permits a fellow being to go on to harm for fear of hurting his feelings by pointing out his danger. The public should kindly but firmly tell the stammerer that, in his interest and the public interest, it must decline to listen if he persists in his distressing misdirected efforts; but it will give him plenty of time to express himself otherwise.

How can the confirmed stammerers be made fit for military duty? Most of those not in actual military service will probably find the affliction less of a burden in war times than otherwise, and there seems to be no way of making them recover promptly. The others who want to recover in order to serve, and the slight stammerers in the service who do not want to run the risk of disqualification in the excitement of service, must seek assistance. There are ways of greatly increasing the rate of spontaneous talking, but that must be done with skill or the result will be injurious instead of beneficial.

But is there no way of quickly making these stammerers fit for service? If by quickly is meant a month's time, no. The world has inexcusably let countless millions grow up in stammering and carry it to the grave while the real remedy has been neglected in searching for the chimerical quick one. Do we decline to build a battleship because it takes a few months of patient labor? Certainly not. Then why longer neglect the certain remedy for stammering?

Public Health Notes.

Returning Soldiers and Disease.—"Many returning soldiers will bring with them communicable diseases contracted at the front, the most serious of which will be syphilis, gonorrhea and tuberculosis, and these men will become centres for the spread of infection among our population. Already between 100 and 200 men have been returned to the Toronto district with tuberculosis, and the hospital doctors indicate that the number of cases of syphilis is large. Anyone familiar with the many forms that these diseases take, will understand the effect that they are likely to produce upon the registered death-rates from many other diseases. Most serious problems of preventive medicine will arise from these diseases."

This statement appears in the *Toronto Health Bulletin* for January, 1917.

The author of the article also points out the tremendous importance of preventive medicine on the battlefield.

"In the South African War and the Spanish-American War, three or four died from disease for every one dying from the enemies bullets. In the present war, the opposite is the case. In fact, so far as the Canadian Expeditionary Forces are concerned, typhoid fever, which claimed such an enormous toll in South Africa, is almost negligible."

*

Typhoid Spread by Toilet.—The *Weekly Bulletin* of New York City for June 16, 1917, tells of an interesting house epidemic of typhoid due to an insanitary toilet. Seven persons were infected, belonging to two families.

"An investigation of the premises undertaken in an effort to determine why such an unusually large percentage of exposed individuals should acquire the disease revealed the presence of a toilet, common to all the members of the entire house, situated in the cellar, kept in not a most sanitary manner, with improper flushing, and from appearances very infrequent washing. The spilling into and over this toilet of typhoid stools which had not been disinfected, the disease not being definitely diagnosed until six days after the onset, and the daily contact of all members of the house with this source of contamination, undoubtedly explains the unusual feature of this house epidemic.

"This outbreak also emphasizes the importance of immunization against typhoid fever and shows the necessity of active coöperation between the attending physician and the health authorities."

*

Health Department Teaches Dietetics.—The high cost of living has prompted the New York City Health Department to give practical demonstrations in cooking and dietetics to mothers at Baby Health Stations.

Public Health Nurses are being instructed in the proper purchase, preservation and preparation of food, with special reference to family income, racial characteristics and nutritional content of foods. The nurses will, in turn, instruct mothers at the sixty-three health stations.

*

Emergency Disinfection of Water Supplies.—*The Illinois Health News* announces that the State Department of Health now has available an emergency outfit for disinfecting public water supplies. Upon the outbreak of a typhoid epidemic suspected to be due to a public water supply, health officers may telegraph the State Department, and the apparatus and an expert to operate the same will be sent out at once.

The type of disinfection is not given; presumably it consists of chlorination.

*

Wound Diphtheria.—Recent numbers of the *Weekly Bulletin* of the New York City Department of Health and of the *Buffalo Sanitary Bulletin* report the finding of the diphtheria bacillus in smears from wounds. "Wound diphtheria," says the New York *Bulletin*, "is uncommon, but its occurrence should be kept in mind, since the toxic effects of the disease upon the individual are frequently as severe as when the infection is on the tonsil."

Framingham's Baby Week.—A very successful Baby Week was held in Framingham, Mass., from May 29 to June 2, conducted under the auspices of the Board of Health with the coöperation of the Civil League, the Community Health Station, the Woman's Club, the Woman's Auxiliary of the Board of Trade and other organizations interested in infant welfare. The ministers in town coöperated by giving appropriate talks from the pulpit on Sunday morning.

Visits were made to the homes of all babies under one year of age, by nurses, inviting the mothers to bring their babies to the conferences and clinics held every day during the week in different sections of the town. These examinations were conducted by Doctor Bradley, of the Children's Bureau, Washington, D. C., Dr. H. Green from the Out-Patient Department of the Massachusetts General Hospital, Boston, Dr. A. B. Emmons, 2d, of Boston, and other children specialists.

A total of 149 babies were examined and any found needing medical attention, if their parents are unable to furnish it, will be given treatment by the Board of Health. Weekly clinics will be held during the year with salaried physicians and nurses in attendance.

The merchants coöperated by displaying articles of interest to parents. Appropriate films were shown at the moving picture houses and a talk was given in connection with these by Professor Selskar Gunn from the Health Department of the Massachusetts Institute of Technology.

An interesting exhibit was held in a vacant store at which inexpensive articles of wearing apparel, home-made refrigerators, sterilizers, and other articles for the care of the baby and its food were on exhibition, together with numerous posters suggesting methods for baby's care. A corps of efficient women were in attendance in the afternoon and evening to instruct the mothers in the use of the different articles displayed. One of the most interesting as well as novel features of Baby Week was the Clean Milk Demonstration arranged by Health Officer Fred S. Dodson, a picture of which is shown herewith. Two cows were secured from local dairies, one from a dairy kept in a very sanitary manner and the other from a dairy which was very insanitary. Daily demonstrations of milking were given accompanied by talks describing the various steps in the operation and the significance of each.

A public exhibition of bacteriological examinations of milk was given in the window of a local drug store. By this demonstration it was hoped to educate the public to the extra necessary expense to raise clean milk and the value of the same, as well as to teach them what a bacteriological count means, so that they will be able to interpret the monthly publications intelligently.

*

Relative Values in Publicity.—In the article referred to on p. 636 Foster evaluates the various types of publicity on the sex hygiene question according to the composite judgment of twelve men in close touch with the work. "The average of their estimates is a safer guide for future work than any individual opinion. The averages should be read in this way: One letter of inquiry answered by the advisory department is worth ten times as much as one circular given out at the close of a meeting."

A few of the "values" are given herewith:

Distribution of one circular after a meeting	1
Attendance of one man at a men's meeting	5.2
Attendance of one parent at a parents' meeting	7.3
Attendance of one pubescent boy at a boys' meeting	8.3
Inquiry answered by Advisory Dept.	10
Placing of one barber-shop book (5 circulars bound)	11.8
Attendance of a teacher at a conference	11.9
Removal of one sex medicine sign	13.3
One visit at a home by an employed worker	14.8
One call at the Advisory Department	17.4
The placing of a State Board of Health placard	26.7

Health Reorganization in Connecticut.—The *Monthly Bulletin* of the Connecticut State Board of Health for May, 1917, prints in full an act of the state legislature, which abolishes the State Board of Health and creates a State Department of Health with increased powers and additional duties.

The new organization resembles somewhat that of New York State and Maine. A Public Health Council is created which has the power to establish and amend from time to time a sanitary code, and to prescribe the qualifications of directors of bureaus. It is an unpaid body, except for actual and necessary expenses relating to duties.

The Commissioner of Health is the administrative head of the department, and is paid $4,000 per year.

District health officers are not included in the plan, but cities and towns are empowered to consolidate for the purpose of establishing sanitary districts.

*

T. B. in Australia.—Louis I. Dublin writing in the *Journal of The Outdoor Life* for June, 1917, corrects a widespread belief that tuberculosis has virtually disappeared from the State of Victoria, in the commonwealth of Australia.

After delivering a few caustic remarks regarding "the amateur in vital statistics and public health work who has been guilty of such wild statements," Doctor Dublin points out the serious consequences of the latter: "When the press is disillusioned, it is all the more likely to discredit the future reports and programmes of competent public health workers."

Reviewing an official report on the subject, he quotes statistics indicating that the tuberculosis death-rate is still high, namely, 86 per 100,000 population in 1914. This rate is no lower than that prevailing in certain sections of the United States Registration Area, Utah, Kansas and Michigan, for example.

*

Occupation and Mental Hygiene.—Elnora E. Thomson, Superintendent of the Illinois Society for Mental Hygiene finds endless possibilities in finding congenial occupations for those handicapped mentally. She says that frequently patients examined for their sanity by physicians, alienists, and neurologists are returned by statements such as the following: "This patient is not a subject for commitment nor is institutional care of any kind indicated. Patient would doubtless be greatly benefitted by congenial employment in a good environment."

A case is cited of a woman 70 years old thought by neighbors to be insane, who was made self-supporting by supplying her with needlework.

"It is contrary to modern ideas of economics to countenance waste. The establishment of schools and workshops for the handicapped, in hospitals and out, will make useful and happy many who otherwise would be a burden to their friends, the state or themselves."

The article appears in *Modern Hospital* for June, 1917.

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Cancer Mortality among Wage Earners Decreasing (Insurance Company Issues Cancer Statistics on 9,000,000 Policyholders).—The larger life insurance companies are closely observing their mortality experience from cancer. This they have done because of the great public interest in this disease and more especially because the figures published by the United States Census Bureau have indicated an increase in the cancer mortality rate. The results of an investigation of cancer mortality of insured wage earners show, however, that in 1916 an actual decrease in the rate occurred. In the Metropolitan Life Insurance Company, Industrial Department, 6,389 deaths from cancer were registered in 1916 and the rate per hundred thousand living was 70.8. In the year 1915 the rate was 72.1 which represents a fall of nearly two per cent. in the rate in one year. The decrease in the rate in 1916 over 1915 was greater than that registered for any previous year.

It is of great interest to observe that the cancer death-rate when considered by organ or part affected does not show the same rate of decrease as that referred to above. The rate for cancer of the stomach and liver increased slightly. On the other hand, the more accessible forms of cancer, such as those affecting the peritoneum, intestines and rectum showed a slight decrease and cancers of the female genital organs, which are quite accessible and readily diagnosed, showed a very marked decrease, from 14.3 to 13.0 per hundred thousand. Cancer of the breast, also an accessible form of the disease, showed a decrease in the mortality rate between the two years studied. Taken altogether, the record for 1916 is decidedly encouraging. The following table shows the rates for the two years 1915 and 1916 respectively, by organ or part affected:

TENDENCY OF CANCER MORTALITY AMONG NINE MILLION WHITE INDUSTRIAL INSURANCE POLICY-HOLDERS

Form of Cancer.	1916.		1915.		
	Deaths.	Rate per 100,-100.	Deaths.	Rate per 100,-100.	Per-cent. decline in 1916.
Cancer—all forms	6,389	70.8	6,129	72.1	1.8
Cancer of the stomach and liver	2,505	27.8	2.307	27.1	2.6*
Cancer of the peritoneum, intestines, rectum...	804	8.9	773	9.1	2.2
Cancer of the female genital organs..........	1,177	13.0	1,212	14.3	9.1
Cancer of the breast.........	587	6.5	587	6.9	5.8
All other cancers..	1,316	14.6	1,250	14.7	.7

* Increase.

The cancer rate among white lives (70.8 per 100,000) was higher than among colored lives (61.8 per 100,000).

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Mental Hygiene Committee.—The National Committee for Mental Hygiene has created a subcommittee on furnishing hospital units for nervous and mental disorders to the United States Government, the project having been approved by Surgeon General W. C. Gorgas of the United States Army.

This subcommittee, of which Dr. Pearce Bailey of New York is chairman, is authorized to secure the services of alienists and neurologists to be commissioned in the Officers' Reserve Corps, Medical Section, and to serve in the neuro-psychiatric units which are to be attached to the base and other hospitals of the military services of the United States. Further information will be given, and application forms sent to physicians qualified in this branch of medicine, on application by letter or in person to The National Committee for Mental Hygiene, 50 Union Square, New York City.

Health Examinations at School Entrance.—The progress that has been made of recent years in the way of health inspection of school children and students is reviewed by W. H. Burnham, Worcester, Mass. (*Journal A. M. A.*, March 24, 1917), who discusses Dr. Thiele's biologic study of school beginners. Thiele sent a questionnaire to the parents of 5,538 children of the public schools in Chemnitz, Germany, in an endeavor to determine the influence of family hereditary disease on children entering school at different ages, and Burnham gives a brief summary of the findings of Thiele and others in this regard. He thinks we should go farther than the German physicians, and that there should be a physical examination participated in by teachers and parents as well as the school physician, including (1) a test of physiologic age; (2) a test of psychologic age; (3) a test of the general health conditions, and (4) a history of the morbidity of the individual child. Importance of each of these tests is dilated on. The morbidity test should include not only the sicknesses past and present, but careful noting of bad habits. The entrance on school life, Burnham says, presents an opportunity for hygiene which has been strangely neglected. There is a feeling with many, however, that we have no right to go further than to keep out contagion, and see that diseases are prevented by vaccination methods, etc. The hygienic needs, however, go much further than this, and it is frequently necessary for the school to take up functions which do not naturally belong to it on account of the ignorance and poverty in many of the homes where hygienic conditions are bad. In his summary, Burnham says: "The reasons for a thoroughgoing health examination like that described above are obvious. Such an examination is desirable: 1. To prevent those children who are in ill health or not sufficiently developed physically and mentally from entering. 2. To provide the necessary physical data to enable teachers so to order the school work that it will not result in injury to health or a check to development, as often happens in the first year of school life. 3. That proper grading and adaptation of school occupations to individual capacity may begin at the outset of school life. 4. To give school physicians the data necessary for safeguarding the health of children against contagious diseases and the like. 5. To give teachers proper knowledge of the new pupils and the right attitude toward them. 6. That children may begin right and be saved from unnecessary failure and retardation or elimination in later grades. 7. To educate parents and foster a right attitude toward the school. 8. To save the money of tax payers, now largely wasted, and so badly needed to provide for absolutely essential hygienic conditions. Children who should be excluded from the school are:

1. Those who have any infectious disease. 2. Children that have rickets, or the after-effects of rickets to the extent that they are in poor physical health and liable to develop neuroses or some other defect from the influence of school work. 3. All children who have tuberculosis, unless there are outdoor schools in which they can be placed. 4. Children who are in a serious condition of anemia, unless again there are outdoor schools in which they can be placed. 5. Those who have any chronic disease which is liable to be aggravated by school attendance or would interfere with school work. 6. Those who are in a retarded stage of physiologic development or mental development, where this would be improved probably by keeping them out of school, and where injury would be done by admission to school, or where it would interfere with school work. 7. Those who have serious sense defects. 8. Those who have any neuroses or the like which would be psychically contagious, epilepsy, chorea, stuttering, and the like. 9. Children who have not been vaccinated." Burnham considers the entrance examination suggestion as giving an opportunity for women's clubs, parent-teachers' associations and similar organizations to use their efforts to bring about public sentiment that will authorize its adoption as quickly as possible. If the plan were given a fair trial in one city or state, he is confident that it would soon become universal. It would help greatly in the diagnosis of doubtful cases, lighten teachers' burdens, develop right attitudes in parents and save later sorrows. In some cases it would prevent greater mental disorders, and in any case is only reasonable justice for the child.

The Practising Physician and the Public Health.—*The Boston Medical and Surgical Journal* for June 14, 1917, contains a recent address on this subject given by Dr. Merrill E. Champion, a district health officer in Massachusetts.

Doctor Champion says:

"The family physician should be the strongest ally which the board of health has. He should work hand in hand with the board, should see that the best representatives of the profession get on the board of health, and that they get adequate compensation for this work. He should work for the appointment of trained, full-time health officers in the cities and towns; he should work for the employment of public health nurses; for an adequate water supply, sewer system, and milk inspection. He should realize that his greatest function is to be the adviser of his families in *all* things which pertain to their physical and mental welfare. He should learn to think in terms of community as well as in terms of family."

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Danger from Old Potatoes.—*The Nurse* for May, 1917, contains a timely editorial on the danger of solanine poisoning from eating old potatoes. Owing to the high cost of this important article of food, more old potatoes will be used this year than heretofore.

"The potato belongs to the same botanical family as belladonna, stramonium, hyoscyamus, and tobacco—which are all powerful narcotics. The potato contains its share of poison in the form of an alkaloid called 'solanine.' While the potato is sprouting, the amount of solanine is considerably increased and may be sufficient to cause serious poisoning.

"Before sprouting potatoes are cooked for food they should be thoroughly peeled and the "eyes" dug out deeply. This greatly reduces the danger of poisoning although it does not insure its entire removal. There is a reason for eating new potatoes."

✣

Laboratory Infection with Typhoid.—The one incontrovertible proof that a given bacterium is the cause of a specific human disease is furnished by the production of that disease in man through infection with pure cultures of the organisms. Not infrequently such evidence has been obtained by investigators through inoculation of themselves or of volunteers; occasionally some progressive murderer has conducted an accurate and convincing experiment, an account of which has subsequently been published not entirely with his approval or under his authorship; and accidental infections in laboratories have furnished conclusive proof far more often than is perhaps generally realized. Of all pathogenic bacteria, the one in worst repute in laboratories is the glanders bacillus, and probably it deserves this reputation. There are many instances, both reported and unreported, of laboratory infection with pure cultures of Bacillus mallei, and with these infections the mortality is extremely high. There is one striking instance of infection of several workers in a laboratory in which cultures of glanders bacilli were centrifugated in a broken tube, spraying the bacilli freely in the air. While typhus is notorious for infecting physicians and investigators, these infections take place through natural methods and not with pure cultures, so that they add little to our knowledge of the disease. Plague bacilli have infected numerous laboratory workers, and so have cholera vibrios. Macfadyen and two of his assistants became infected with the bacillus of Malta fever during experiments with this organism, the disease ending fatally in the chief.

Perhaps on account of its widespread use in laboratories, the typhoid bacillus has been especially prominent as a cause of laboratory infections; but fortunately the mortality rate is so much lower than with most of these other diseases that it has probably not caused many fatalities. These infections have had also a certain scientific value, since typical typhoid fever cannot be produced in laboratory animals, and hence each carefully observed case of laboratory infection consitutes an accurate experiment. If we are correctly informed, the first person to demonstrate conclusively the specific etiology of typhoid fever was a serving woman in the Pasteur Institute who, for some reason tired of life, took advantage of the means at hand and swallowed a culture of typhoid bacilli. She did not die, and hence failed to accomplish both her own purpose and the final anatomic demonstration of the experiment; but she did pass through a typical course of typhoid fever. Since that time accidental and intentional infections with typhoid bacilli have been reported frequently.—*Journal American Medical Association*, March 25.

Public Health Clippings.

Sanitary Crimes.—The United States Public Service suggests the following ways of making oneself ridiculously inconsistent: Repeat the golden rule and then sneeze in somebody's face; or, think that dog muzzling is cruel, and then marvel at the spread of rabies; or carefully select your brand of liquor and then feed your children unpasteurized milk; or go camping out for your health and then place your toilet so that it drains into your water supply.—*Kansas State Board of Health Bulletin.*

✠

The Leprosarium Bill.—President Wilson has signed the bill establishing a national leprosarium under the United States Public Health Service, and appropriating $250,000 for the purpose. Health officers and boards of supervisors, to say nothing of the lepers, will be glad to learn that the known lepers of the United States will soon be gathered into a colony where they will be under scientific treatment and where there can be an approach to normal companionship and community life.—*Monthly Bulletin*, California State Board of Health.

✠

Wrapping Garbage.—All garbage should be wrapped in newspapers after each meal and deposited like cordwood sticks in your garbage can. Flies cannot get at it, and smells are prevented. Flies are a real source of danger. One of these which has been crawling on garbage or offal or manure may subsequently crawl over baby's milk bottle nipple and deposit millions of filth germs upon it, capable of producing severe illness in the baby. If you have not a baby some of your neighbors have.—*Toronto Health Bulletin.*

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Amen!—One-half of the fools think they can beat the doctor healing the sick; one-third think they can beat the lawyer at his game; one-fourth believe that they have it all over the preacher; and all of them think they know how to run the health department.—*Buffalo Sanitary Bulletin.*

✠

Constable and Nuisances.—Not only are the police in California cities being used as allies in the enforcement of regulations pertaining to the public health, but in the rural districts of Los Angeles County each constable has been made an inspector for the county health office.—*Monthly Bulletin*, California State Board of Health.

✠

Early Diagnosis.—It has been found in New York City that eight per cent. of pushcart peddlers are syphilitic. It is but rarely that an early case of tuberculosis, in its curable state, is discovered among the colored population. These people take almost no precautions and medical advice is not obtained until they are unable to work. Early discovery of cases of tuberculosis and of syphilis is perhaps one of the most essential needs in the control of these two diseases, the social diseases, that bring such havoc to modern civilization. The greater the opportunities that are offered for discovering cases of these diseases early, the greater the results in the conservation of the public health. —California State Board of Health, *Bulletin*, March, 1917.

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Curbstone Medical and Health Advice from salt-barrel philosophers and town gossips is usually worth just a little less than it costs.—*Illinois Health News.*

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The State of Virginia is conducting a unique rural campaign of health publicity. Recognizing that millions of dollars have been drawn from the pockets of the country people through glaring signs tacked on the trees and fences along the highways, the Virginia State Board of Health is sending men throughout the state tacking up tin lithographs of black and orange setting health truths in most attractive style. One of the placards reads as follows:

"The Best Farm in this county is the one on which the health of the family is best protected.

"It has a good well.

"It has a sanitary privy.

"It has screens on the windows and doors to keep out flies and mosquitoes.

"It has no standing water in which mosquitoes can breed.

"Make it yours."—*Illinois Health News.*

The Old Farmer's Household Remedies.—Selected from "An Easy and natural Method of Curing most Diseases, extracted from some of the best Authors," in Bickerstaff's Boston Almanac for 1769.

This selection is reprinted from the *Atlantic Monthly Almanac* for 1916.

The Apoplexy. To prevent, use the cold bath, and drink only water.

The Asthma. Take a pint of cold water every night, as you lie down in bed.

To Cure Baldness. Rub the part morning and evening, with onions, till it is red; and rub it afterwards with honey.

Boils. Apply a little venice turpentine.

Chilblains. Apply salt and onions pounded together.

Chin-cough or Hooping-cough. Rub the feet thoroughly with hogs-lard, before the fire, at going to bed, and keep the child warm therein.

A Cold. Drink a pint of cold water, lying down in bed.

A Cold in The Head. Pare very thin the yellow rind of an orange. Roll it up inside out, and thrust a roll into each nostril.

A Consumption. A beginning consumption was cured by drinking decoction of guaiacum morning and evening for fifteen days (without sweating) with a light diet. Cold bathing has cured many deep consumptions. Or live on raisins and bread, and drink only decoction of barley and liquorice.

A Consumptive Cough. To stop it for a time, at lying down, keep a little stick liquorice shaved like horse-radish, between the cheek and the gums. I believe this never fails.

An Inveterate Cough. Use the cold bath. It seldom fails.

The Cramps (to prevent). Tie your garter smooth and tight under your knee, at going to bed.

The Cramps (to cure). Stretch out the limb immediately.

Drowned. Rub the trunk of the body all over with salt. It frequently recovers them that seem dead.

Dull Sight. Drop in two or three drops of juice of rotton apples often.

A Chronical Head-Ach. Keep your feet in warm water, a quarter of an hour before you go to bed, for two or three weeks.

The Rheumatism. Use the cold bath, with rubbing and sweating.

The Head-ach. To be electrified.

A Sore Throat. Take a pint of cold water lying down in bed.

A Sprain. Hold the part in very cold water for two hours.

A Stitch in The Side. Apply treacle spread on a hot toast.

To Clean The Teeth. Rub them with ashes of burnt bread.

To Prevent The Tooth-ach. Wash the mouth with cold water every morning.

To Cure The Tooth-ach. Be electrified thro' the tooth. Or, keep the feet in warm water, and rub them well with bran, just before bedtime.

Inability to Sleep. Apply to the forehead for two hours, cloths four times doubled and dipt in cold water. I have known this applied to a lying-in woman, and her life saved.

Whooping Cough. A gentleman who has tried it says that yellow pond-lily root, dried and pulverized, mixed with an equal quantity of honey, and taken a spoonful at a time, several times a day, will not only relieve the whooping cough, but will cure it in a short time.

Generally where Cold-bathing is necessary to cure any disease, Water-drinking is so, to prevent a relapse.

*

Fumigation.—"In such diseases as scarlet fever and poliomyelitis the concurrent disinfection of discharges from the nose and throat should be carefully done; in typhoid fever, disinfection of the urine and feces. Fumigation in these diseases doesn't amount to a tinker's dam.

"When a man knows that a disease is transmitted in a certain way and neglects to block that way, salving his conscience by doing a little fumigating, I don't know of anything that would come nearer to establishing his eligibility for residence in a home for the feeble-minded."—Dr. S. H. Landis in *The Ohio Public Health Journal.*

*

West Virginia has joined the ranks of those states that now have a state-wide Public Health Day. The governor, John J. Cornwell, designated April 16 for 1917.

Unreported Babies.—When all these persons grow to adult life and require their birth record—as most of them surely will—they will blame everybody except those directly responsible, namely, the parents, physicians or midwives—but that will not rectify the omissions or help out the individuals.—*Buffalo Sanitary Bulletin.*

✤

Disease Spreaders.—"Ten ways spreading diseases are by the ten fingers. Keep the mouth and teeth clean and the hands away from the mouth. Vaccinate for whooping-cough. The rash and scales in scarlet fever have nothing to do with infection the throat is where the contagion lies. In diphtheria, the antitoxin has no effect on germs or membrane, but prevents the deadly effect on the heart. Fingers in the mouth are responsible for much of typhoid fever." (Goler) — *Monthly Bulletin* (New Haven).

Exposure and Pneumonia.—Though penumonia is commonly believed to be due to exposure to cold or wet, it has very little to do with these. You will not catch pneumonia after breaking through ice or getting lost in the snow, unless you already have the germs of the disease in your mouth and throat and your constitution has already been run down by bad air, underfeeding, overwork or dissipation. Arctic explorers, for instance, never catch pneumonia in the frozen North.—*Public Health* (Michigan).

✤

Do Not Enlist Now.—Health officers, sanitary engineers and all health workers should not enlist until they can be assigned to best advantage—your services are many times more valuable to your country in your chosen profession than in the army or navy as a soldier or sailor.—*Monthly Bulletin* (Connecticut).

Industrial Hygiene and Sanitation.

Medals for Safety.—Details of some of the safety devices for which the American Museum of Safety granted medals are available in the May number of *Safety*. The *Scientific American* Medal was awarded to the Pullman Company of Chicago for the invention of the "Dean End Frame" by the company's vice-president, Mr. Richard Dean. The invention consists in a modification of the construction of the cars so as to reduce to a minimum the damage done to the cars and consequently to afford greater safety to passengers. The Travelers Insurance Company's Medal went to the Commonwealth Steel Company of St. Louis, because of the conspicuous success which has attended the company's organized work for the reduction of accidents and the promotion of operative details. The Leaman Gold Medal was awarded to the Julius King Optical Company of New York for scientific research in overcoming the harmful effects of ultra-violet and infra-red rays of light in connection with arc-welding and other industrial processes at very high temperatures. All of the researches conducted in what was practically an unknown field. The helmets adopted are made of fiber, finished within and without in dead black so as to minimize the danger from reflected light.

✤

Report on Compensation.—A "Summary of Report on Workmen's Compensation Acts in the United States" with reference to the legal phase of the problem was published by the National Industrial Conference Board, 15 Beacon Street, Boston, Mass. The pamphlet covers the pertaining facts in a concised manner.

✤

Oven Explosions.—The May number of *Safety Engineering* states that the Ford Motor Company has had a number of serious explosions in their enameling ovens throughout the country. Experiments proved that the explosions would not injure the oven if the top of the oven were not fastened down securely. All Ford enameling plants are now changed so that in case of explosions, the tops will lift and dissipate the force of the explosion without damage to the ovens.

The following is a summary of important articles which appeared in the June issue of the *Monthly Review* of the United States Bureau of Labor Statistics. Many of these articles deal with the changes brought about by the present war in the industrial fabric of the allied countries. The director-general of national service in Great Britain has taken steps to obtain a pool of male labor for the purpose of releasing men engaged in industrial work of national importance for army service and reinforcing the present staffs at certain very important works. Two lists of trades have been prepared, one of which enumerates occupations of primary importance. Both lists appear in detail.

The British Board of Trade *Labor Gazette* (April, 1917) cites two instances in which it was shown that the shortening of hours brought about a marked increase in production. These two instances are those of a shoe manufacturer employing over 4,000 men in seven factories and of a tool manufacturer employing about 500 men. The tool manufacturers reduced the hours of labor by about nine per cent. and secured an increase in production of ten per cent.

⁂

Reëducation of Disabled Soldiers.—What France is doing for her disabled soldiers and sailors is very interestingly discussed by Percy Alden, M. P., in the January number of the British Institute of Social Service. A large number of experiments are being made with regard to medical treatment, and especially with regard to the training and reëducation of men, who otherwise could be entirely dependent upon their pensions. A new body was created in France to deal exclusively with this problem. The problem was studied with great care. There are over 101 existing or proposed institutions for reëducation in various departments, and in addition there are four schools founded and supported by the union of foreign colonies in France. The system of reëducation and the pension system is given in considerable detail. The article is concluded with a series of suggestions regarding the treatment of disabled soldiers in the United Kingdom. The Canadian Military Hospitals Commission Bulletin, Nos. 1, 2 and 3 deals with the same problem pertaining to the Dominion. Pages 915–949 of the *Monthly Review* dealing with the government control of food supplies in France, Germany and Great Britain throw a glaring light upon the present food situation in these three countries. To what extent the war has affected the price of food in United States and a number of foreign countries is evident from a study of pages 952–972.

⁂

The United States Department of Labor has organized the United States Boys' Working Reserve for the purpose of meeting the labor shortage in certain industries, notably farming. There are within the United States over four and one-half million of boys between the age of 16 and 21 years, more than two million of which are not engaged in any productive industry. The first call for the services of the Boys' Working Reserve came from the canning industry.

⁂

The New York Office and testing station of the Underwriters' Laboratories is now located at 25 City Hall Place.

Communications.

To the Editor:

The accompanying statements are quotations from the final examination papers of a class in "Hygiene" in a Class A medical school:—

"Rabies is transmitted by the sylvia of a dog or cow."

"People may be poisoned by the sodamint in potatoes." (This reference was presumably to solanin.)

Speaking of food and its effect upon health: "The national law would cover everything that would come up."

"Avoid inhalation of dust by wearing aspirators."

"Disinfect hands by ———, lots of enthusiasm and elbow grease ten minutes."

"Pasteurized milk causes constipation and is not suited for children. It cost more than inspected. If can afford it it is best."

"The advantage of the pasteurization is that it cost more and it is very healthy to public."

"Adulteration of food these substances or meterials are much in the way and causes much to the neihborhood or public."

To disinfect woodwork in a room: "Best to burn up," and from another "Scrub with boiling water."

"Malaria is transmitted by the Anapolis mosquito."

"Malaria is caused by the Spasmodium of malaria."

"To prevent lead poisoning among painters: Where masks, drinking sulphides."

"Goldfish prove good destroyers of the lava of mosquitos."

"A cattle of boiling water."

While they are given primarily for the amusement of the reader they ought also to prove a subject for serious consideration. Perhaps the first conclusion to be drawn is that the plan of lecturing to a large class without an opportunity to reinforce the instruction by quizzing is not a satisfactory one. This is especially true where the usual custom of not returning the final examination papers is in force. The student has no opportunity to observe his mistakes or to correct erroneous impressions and with the prestige of an M. D. goes out to retail his misinformation to the public. This fault does not lie with the professor who has to crowd so large a subject into fifteen or thirty lectures. It is not desirable to take the time of a class of from 50 to 150 students for oral quizzing and so far as is known no medical school uses the plan of dividing the class into small quiz sections. That the other courses have the same defect is shown by the fact that the above answers include misstatements in physiology, zoölogy, materia medica, and bacteriology;—not to mention spelling and common sense. Fortunately for the reader the writing cannot be reproduced but in many cases it lends weight to the statement that in medical school students are taught to write prescriptions illegibly.

To those who believe that the degree of Doctor of Medicine is not an essential requirement for a health officer these answers may prove impressive. A general practitioner in a small town recently said that the two courses most neglected and ridiculed when he was in medical school were hygiene and dietetics and these were the two courses for which he had found most frequent need since he had been in practice.

The writer believes that it is desirable that a health officer should be a graduate of a medical school if possible, but he is far from believing that the "M. D." means that a man knows anything about sanitation and public health or that the law which merely requires that the health officer must be a graduate of an accredited medical school is worth while.

LECTURER ON HYGIENE.

Personal Notes.

Dr. Wm. H. Coon has been appointed Director of the Health Department of Kansas City, Missouri. Doctor Coon was a District Health Officer of the State Department of Health of Massachusetts for many years and has recently been employed by the Harvard Infantile Paralysis Commission. It is planned that a complete reorganization of the Kansas City Health Department will be carried out by Doctor Coon.

*

A commission of sanitary, social, medical and food distribution experts has been appointed to proceed at once to Russia under the auspices of the Red Cross to make a survey of the social needs of the people, particularly as to sanitary and health problems. This commission is headed by Dr. Frank Billings, Chicago. Dr. William S. Thayer, professor of clinical medicine in Baltimore, and Dr. Wilber E. Post, assistant professor of medicine at Rush Medical College, will investigate the general medical problems which may arise. Dr. D. J. McCarthy, Philadelphia, will act as tuberculosis expert. Mr. Harold H. Swift of Swift and Company, Chicago, goes as the food expert of the commission, and Prof. Henry C. Sherman, professor of food chemistry, Columbia University, New York, will have charge of the scientific aspects of the food problem. Prof. George C. Whipple, professor of sanitary engineering, Harvard University; Prof. C. -E. A. Winslow, professor of public health at Yale University, and Dr. Malcolm Pirnie, assistant to Professor Winslow, will be concerned with the sanitary and hygienic problems. Mr. Raymond Robins, Chicago, will investigate sociologic questions, representing the social labor group. Dr. William Groh, Philadelphia, is medical attaché, and Dr. O. F. Whitman of New York will act as moving picture director. The business director of the commission will be William B. Thompson, banker of New York City. Among the remaining personnel are: Allen Wardwell, New York, secretary; James W. Andrews, New York, treasurer; H. F. Brown, New York, publicity; Henry J. Horne, New York, transportation; William C. Nicholson, Chicago, secretary to Mr. Swift; Thomas B. Thatcher, New York, secretary to Mr. Thompson; Robert I. Barr, New York, assistant to Mr. Thompson; William Cochran, New York, assistant to Mr. Horne; Cornelius Callaher, New York, stenographer to Mr. Thompson; Harry B. Redfield, New York, stenographer; Harold M. Wycoff, New York, motion picture operator; Lawrence C. Houghteling, Chicago, attaché. There will also be several attachés who are versed in the languages of the far east, as well as in Russian, French and German; valets, etc. The commission leaves Chicago, June 30, and a Pacific port during next week.—*Journal American Medical Association.*

*

Dr. Bryon U. Richards of Pawtucket, R. I., has been elected Secretary of the State Board of Health of Rhode Island, succeeding in this position Dr. Gardner T. Swarts. Doctor Swarts served as Secretary of the Board for twenty-three years and during that time has been recognized as one of the most prominent public health workers in the United States. His legion of friends wish him every happiness, and know that, although no longer serving in an official capacity, his interest in public health work will remain unabated.

*

Dr. Hiram Byrd of Princeton has accepted the appointment of Scientific Secretary to the Florida State Board of Health.

*

Dr. W. H. Cox of Brooksville has accepted the appointment of State Health Officer of Florida.

*

In the June JOURNAL we announced that Dr. Francis H. Slack had accepted the position of pathologist, bacteriologist, and serologist in the Sias Laboratory, Brooklyn, N. Y. We should have stated that this laboratory is located in Brookline, Mass.

*

Dr. L. D. Bristol has been appointed Commissioner of Health of the State of Maine. Previously Doctor Bristol was offered the position of State Health Officer of Nebraska which he declined.

*

Dr. Charles H. Holt, Superintendent of Health of Pawtucket, R. I. has left to join the Medical Reserve and Dr. J. H. Bennett has been appointed to succeed him.

Current Public Health Literature.

AMERICAN.

American Food Journal, Chicago.

VI. June.

A Legal Butter Color. Editorial.
Fraudulent "Egg Substitutes" and "Egg Savers." C. H. LaWall.
Purification of Water Supplies. H. E. Barnard.
Commercial Canning. A. W. Bitting and K. G. Bitting.
The High Quality of Canned Foods. L. V. Burton.

Boston Medical and Surgical Journal.

CLXXVI. June 14.

The Practicing Physician and the Public Health. M. E. Champion.

Interstate Medical Journal, Chicago.

XXIV. June.

Tuberculosis in Infancy and Childhood. John B. Hawes.
Some Aspects of Malaria in Children. W. H. Deaderick.
Institutional Treatment of Disease and Specialization. F. M. Pottenger.
Immunity from Hay Fever an Important Asset in National Mobilization. Wm. Scheppegrell.
The Modus Operandi of Epidemics.

Journal of the American Medical Association, Chicago.

LXVIII. June 2.

Epidemic Vincent's Angina Affecting Troops. A. R. Campbell and A. D. Bramshot.
Complement Fixation Tests in Tuberculosis: A Comparison of the Autolysate Antigen and Miller's Bacillary Antigen. H. J. Corper and H. C. Sweany.
One Road to the Control of Heart Disease. Henry Sewall.
Public Health Instruction in Medical Schools. M. J. Rosenau.

June 9.

A Water-Borne Epidemic of Typhoid Fever: Isolation of the Typhoid Bacillus from the Contaminated Supply. Geiger, Macmillan, and Gillespie.

June 16.

Tuberculosis and War. Maurice Fishberg.

June 23.

The Care of Cripples as a Problem for Each Individual State. E. W. Ryerson.
Three Years' Experience in the Search for Typhoid Carriers in Minnesota. Chesley, Burns, Greene, and Wade.
Hookworm Control in South China. Edward H. Hume.
A Typhoid Carrier Problem. H. F. Senfter.

Journal of Bacteriology, Baltimore.

II. May.

The Colorimetric Determination of Hydrogen Ion Concentration and Its Application in Bacteriology. III. Clark and Lubs.
The Use of a Three Per Cent. Lactose Litmus Agar Plate for the Demonstration of B. Coli in Water Examination. E. M. Meyer.
A Simple Method for Staining the Capsules of Bacteria. F. M. Huntoon.
The Fallacy of Refined Readings of Gas Percentages in the Fermentation of Lactose Peptone Bile and Lactose Broth. Browne and Ackman.
Note on the Reaction of the Paratyphoids, Alpha and Beta, in Litmus Milk. P. B. Hadley.
Study of the Diphtheroad Group of Organisms with Special Reference to Its Relation to the Streptococci II. Classification. R. R. Mellon.
The Fuchsin-Aldehyde Reaction on Endo Medium. G. G. De Bord

Journal of Laboratory and Clinical Medicine, St. Louis.

II. June.

Smallpox Vaccination at the University of California. J. N. Force.
Report on Prophylactic Vaccination with B. Typhosus, B. Paratyphosus A, and B. Paratyphosus B. W. C. Davison.
Significance of Lamblia Intestinalis in Stool Examinations. A. H. Logan and A. H. Sanford.
Studies of Complement: Relation to Certain Tests. N. E. Williamson.

Journal of Outdoor Life, New York.

XIV. June.

Climate and Tuberculosis. J. W. Trask.
Tuberculosis in Australia. Louis I. Dublin.

Medical Reviews of Reviews, New York.

XXIII. July.

Birth Control: Its General and Medical Aspects. A. L. Goldwater.
The Bat as an Eradicator of the Mosquito. S. A. Campbell.

Military Surgeon, Washington, D. C.

XL. June.

Collection and Evacuation of Sick and Wounded from Front to Base. T. H. Goodwin.
Diagnosis of Tuberculosis in the Military Service. G. E. Bushnell.
Sanitary Service of the Austro-Hungarian Army in Campaign. J. H. Ford.
Epidemiological Study of an Outbreak of Measles, Camp Wilson, San Antonio, Texas. E. L. Munson.
The Illinois Camp of Mobilization. Jacob Frank.
Effect of Submarine Duty on Personnel. .W. W. Cress.
Technique of Anti-Typhoid Inoculations. J. H. Allen.

Modern Hospital, St. Louis.

VIII. June.

Occupation and Its Relation to Mental Hygiene. E. E. Thomson.
Symposium on Occupational Therapy.

New Orleans Medical and Surgical Journal.

69. June.

Camp Sanitation and the Training of Sanitary Troops. W. A. Love.

National Municipal Review, Philadelphia.

VI. May.

Recent Public Health Reports. A. W. Hedrich.
New Orleans' Increasing Political Health. E. E. Moise.

New York Medical Journal.

CV. May 26.

A Constructive Health Program for Urban Schools. I. H. Goldberger.
The Mental Hygiene Movement. Editorial.

June 2.

Systematized Boarding Out versus Institutional Care for Infants and Young Children. H. D. Chapin.
Analysis of a Series of Typhoid Fever Cases. S. Steiner and J. W. Brandeis.

June 9.

The Louse Problem. H. C. Hall.

June 23.

Constructive Suggestions Toward the Control of Tuberculosis in Times of Peace and in Times of War. S. A. Knopf.
Birth Control and the Physician. J. S. Greene.
Constructive Suggestions Toward the Control of Measles, Scarlet Fever, Diphtheria, and Whooping-Cough. S. J. Baker.

Public Health Journal, Toronto.

VIII. June.

Poliomyelitis. H. W. Hill.
Clinical Studies of Infantile Paralysis. E. J. Doucher.
Public Health in the Average Town: Ways and Means of Conducting. C. A. Patterson.
Practical Points in Enforcement of the Regulations and the Difficulties of the Medical Officer of Health. H. Ross.
How Could a Rural Municipality Employ a Public Health Nurse. J. F. Hanly.
Overcrowding—Why is it Tolerated? Thos. Watson.

Southern Medical Journal, Birmingham.

X. June.

Some Problems in the Etiology of Poliomyelitis. W. H. Frost.
The Tuberculosis of Infants. Mary E. Lapham.
The Work of the U. S. Public Health Service with Reference to Malaria. R. C. Derivaux.
Prophylaxis in Mental Disease. W. C. Sandy.

Survey, New York.

XXXVIII. June 9.

The Red Cross Commission to France.

June 23.

The History of Poliomyelitis in 1916.

June 30.

Industrial Poisons in Munition Plants. Gertrude Seymour.

U. S. Public Health Reports, Washington, D. C.

32. June 1.

Maintenance of Health in Industries. J. W. Schereschewsky.
Immunization against Typhus Fever. G. W. McCoy.

June 8.

Occupation and Mortality. S. W. Wynne and W. H. Guilfoy.

June 15.

Morbidity Statistics of Hospitals. E. W. Knopf.

June 22.

Public Health Administration in Piqua, Ohio. Carroll Fox.

BRITISH.

Journal of State Medicine, London

XXV. May.

Prevention and Arrest of Certain Epidemic Diseases in War Time. S. M. Copeman
Tuberculosis and War. James Crichton-Browne.
Tuberculosis Problem in War Time. T. D. Lister.

June.

Sterilization of Unsound Meat. W. J. Howarth.
Tuberculosis Problem in War Time. T. D. Lister.
Protection of the Milk Supply. W. G. Savage.
Remarks on Clean Milk Standards. Sheridan Delepine.
Congo Red Blood Serum: A Culture Medium for the Meningococcus. J. H. Johnson.

Medical Officer, London.

XVII. May 26.

Midwifery Service in the County of London.
The Proposed Sale of Sterilized Meat. Phillip Boobyer.

June 2.

Education and Physical Fitness in Relation to Employment.

June 9.

Remuneration for Infant Welfare Work.
Notes on the Collection and Disposal of House Refuse. C. H. Cooper.

American Journal of Public Health
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SANITATION IN SOME CANADIAN BARRACKS AND CAMPS.

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Director Antitoxin Laboratory, University of Toronto,
and
Major J. W. S. McCullough, M. D., D. P. H., C. A. M. C.,
Chief Officer of Health, Ontario.

THE following information is the result of some three years' experience as sanitary officers of the largest military district in Canada. It embraces an account of the general and personal sanitation of large bodies of men and both improvised winter quarters and summer camps. It is gratifying to the writers to be able to say that, while there were many cases of one and another form of communicable diseases, considering the large number of men involved, no serious epidemic occurred. In the first two winters there were sharp outbreaks of cerebrospinal fever, which prompt measures kept under control. These will be referred to at a greater length in another part of this article. We were singularly free from typhoid fever, thanks to general precautionary measures, and particularly to the care of the water supply and inoculation.

GENERAL SANITATION.

Barracks.—The barracks used for Canadian soldiers were mostly improvised buildings otherwise used as schools or for exhibition purposes. In some cases armories were used. Most of these buildings were large enough for the accommodation of an entire battalion, between 1,000 and 1,100 men. Smaller buildings to quarter 30 to 50 men would be much better, particularly in case of an outbreak of communicable disease.

Ventilation.—In barracks, careful attention was directed to ventilation, and endeavor made to provide at least 400 cubic feet of air space for each man. When possible, windows were left open during the night, and at intervals of an hour, the doors were opened for five minutes by the quarter-guard.

Heating.—In the barracks during winter, heat was maintained by whatever happened to be the readiest plan available. In some, large coal stoves were used; in others, hot water heating, previously in existence in the building, was maintained.

Bunks.—The bunks were of wood, double-decked, usually creosoted, and built to accommodate eight men. They were raised ten inches to one foot from the floor so as to readily allow of sweeping underneath. Straw palliasses were used during the first winter of the war, but were abandoned thereafter, because they were liable to leave dirt and litter.

Floors.—In the cleaning of quarters no dry sweeping was allowed. The floors were first sprinkled with 1-40 strength of the following standard solution:

1. Crude carbolic.
2. Soft soap,
3. Water.

Latrines, Ablution Tables and Baths.—The latrines in barracks were practically all of the flush type. There was ample water, both hot and cold, for ablution and bathing purposes. In order that these places should be maintained in strict sanitary condition, a special sanitary detail was constantly on duty in the day time. In some cases tin basins were used by the men, and these, when not in use, were kept in a 1-40 strength of the standard solution already referred to.

Care of Dishes and Kitchen Utensils.—As a protection against infection, all dishes and table-and kitchen-utensils were required to be subjected to *boiling* for at least five minutes after each meal. For this purpose galvanized iron tubs, each containing an inner tub perforated with numerous inch-in-diameter openings and capable of holding 100 pint mugs, or their equivalent of dishes, were provided. The water in these was heated by setting the tubs on gas plates. Four tubs and six containers were provided for each battalion (about 1,100 men) the extra containers being filled with dishes ready to be placed in the tub of boiling water when another was completed. This is to avoid delay. The heavy container was placed and removed by a block and pulley or by two men. The dishes were dried on racks.

LATRINES.—Latrines in camps consisted of strongly built huts, accommodating eight men at a time. Metal bucket containers were used. The contents of these and of the urine tubs which were placed in an adjacent enclosure were removed by a contractor to a distance of a couple of miles, twice a day. The buckets were placed under a hinged seat in the huts. The openings over the buckets were closed by a lid which automatically shut as the seats were vacated, thus preventing the excreta being reached by flies. While the doors of the huts and ventilators were arranged to close automatically, it was not found practicable to keep them closed in hot weather. Each battalion was allowed six latrine huts accommodating forty-eight men at a time. Accommodation in the same proportion, about 5 per cent., was provided for the officers.

The huts were so arranged that the buckets could be removed by raising the top of the seat or through a hinged door at the back. The latter is a poor arrangement, as the door, being outside, swells with the wet and soon refuses to close properly, thereby allowing the admission of flies. On removal of the contents, the buckets were swabbed with the carbolic soap solution, and both in the excreta and urine buckets a small quantity of the solution was left at each time of emptying. The latrine hut floors and seats were scrubbed each morning with the same solution.

ON THE MARCH.—Short and shallow trenches 1′ x 1′ x 3′ were used for excreta and urine on the march, each man being required to cover his excreta with dry earth. All areas were required to be left as found by the troops. Manure, garbage and rubbish were burned.

QUARTERS IN CAMPS.—Tents were rolled every morning and, except in wet weather, blankets were placed outside during the day time. In case tent floors were used, these were washed every day with the carbolic-soap solution and twice a week taken out and left in the sun for several hours. Every three weeks the tents were struck for one-half a day, the floors removed and the area under them exposed to the air and sunlight.

Strict regulations were in force prohibiting the use of food in tents and no scattering of litter and rubbish was permitted.

WATER SUPPLY.—At one of the camps the ultra-violet ray (R-U-V type of machine), following treatment by a roughing sand filter, was used to purify the water. While this gave satisfactory results, it proved to be an expensive method, and we have arrived at the conclusion that the most practical method of water purification in camps where this is necessary is the use of hypochlorite of lime. It is simple, cheap, and most efficient.

All wells or other sources of supply on the line of march were examined by the laboratory unit and only those allowed to be used which were found safe. It was found that the large majority of wells and springs in well settled country districts were contaminated, probably from surface pollution.

GARBAGE.—Garbage was kept in covered cans in a screened enclosure and removed twice a day. In another camp the garbage and camp litter were burned in metal incinerators constructed for the purpose. As there are about 500 pounds of combustible material in each unit of 1,100 men, the burning of garbage and litter is quite feasible. Indeed, manure may also be readily destroyed in this way, but in an agricultural community where it may be utilized to advantage, it is a waste to burn manure. Non-combustible material such as tin cans, bottles, wire, etc., were removed to some distance from the camp, sprayed with crude oil, and burned. This not only reduces their bulk, but destroys any remnants of their contents. Bones were placed in securely covered barrels and removed by a contractor who purchased them from the Militia Department.

INCINERATORS.—Many types of incinerators were devised, such as the well-known saucer-shaped one of stone, brick or sods with a center cone for ventilation: the oblong one of brick, cement or stone; the circular one constructed of sods about a cask or barrel, etc. The important point about any type is that a good fire be maintained constantly.

In one camp metal incinerators were installed. Some units, by an ingenious arrangement of coils, made use of the heat therefrom to boil water for use in sterilizing dishes, heating bath water, etc.

Blankets.—All blankets in use were sterilized by steam at intervals of two or three weeks, facilities being provided whereby 3,000 or 4,000 blankets could be subjected to live steam for from twenty minutes to half an hour at a time. The blankets were dried by shutting off the steam and exposing them to dry heat for five minutes.

The arrangements for the sterilization of blankets were briefly as follows: An airtight chamber or chambers were constructed. Half-inch perforated steam pipes to allow exit of live steam were placed along the sides. Other steam pipes for drying purposes were placed nearer bottom of the chamber walls. These pipes were connected up with a steam boiler. Steam-cocks were adjusted to control the operation of moist or dry heat as desired. Pressure and temperature gauges were attached. Cross rods were supplied upon which the blankets were hung.

The whole apparatus was constructed at very reasonable cost and proved most effective.

Personal Sanitation.

Baths.—Ample bathing facilities were provided. In winter both hot and cold water showers were available. Foot troughs were also provided. In the summer camps there were cold showers only. At Niagara and Camp Borden the adjacent lake and river were used for regular bathing parades.

Boots and Care of the Feet.—The officers, non-commissioned officers and men received instruction in this subject and paid a great deal of attention to boots. The medical officer or his representative, as well as the quartermaster, were present at each issue of boots in order to see that the men were suitably fitted. The medical officer made a personal examination of each man's boots and kept a record of them. If complaint was made by any man about his shoes, the difficulty was sought, and by means of exchanges and frequent inspection, much disability from ill-fitting and unsuitable shoes was prevented. Men were advised to keep their feet scrupulously clean, to keep their socks in good condition, to turn and dry them after a march and to harden the feet by cold ablution and the use of alum solution after a march. Foot troughs were provided so that ample means for foot-washing were available. Blisters and abrasions were given careful attention, and corns and bunions alleviated at the earliest moment. Blisters were opened with a valve-like opening, and then painted with iodine.

Men's Clothing.—The men's clothing was sterilized in the steam plant. This was found to be satisfactory, except that the leather collars required to be removed, as the steam destroyed them.

In cases where the clothing was infected with vermin, a useful measure was found to be that of immersing them in gasoline. Immersion of one or two minutes was found to be sufficient to destroy the vermin and the eggs as well.

COMMUNICABLE DISEASES.

In the great wars of the past, plagues have been responsible for more deaths among troops than have any acts of the enemy; so every care has been taken to protect enlisted men from communicable diseases. The disorders caused by the contamination of food and water with alvine discharges containing germs responsible for the production of intestinal diseases, have in recent wars wrought great havoc. Typhoid and paratyphoid fevers, and dysentery, did more damage in the Boer War and Spanish American War than any act of the enemy. In earlier wars, smallpox was one of the greatest scourges.

In Canada all troops were vaccinated against smallpox. This was compulsory, and unless a man had been vaccinated within the previous few months, he was vaccinated or revaccinated.

INOCULATION AND VACCINATION.—Typhoid inoculation alone was in use up to May, 1916, when mixed vaccine began to be used. The technique consisted in the use of a 10 cc. sterilized syringe and separate needle for each man. Immediately below the collarbone an area about one inch in diameter was painted with tincture of iodine, and the injection made subcutaneously. The first and second doses contained 500 million of mixed dead bacteria, and the third 1,000 million. The injections were given at intervals of seven days, and vaccination was done on the day preceding the last injection, so that the entire process was completed in two weeks. Men were not required to do any heavy duty such as marching, for the next twenty-four hours. While there was a moderate reaction in the majority of cases, evidenced by slight headache, malaise, slight chills, etc., comparatively few cases showed any marked disability and there has in no case resulted any permanent ill-result. Very few cases went to hospital; the longest hospital period in any case for this cause did not exceed forty-eight hours. All the typhoid and mixed vaccine used by Canadian troops has been supplied gratuitously by the Laboratories of the Provincial Board of Health of the Province of Ontario. The smallpox vaccine used has been chiefly that prepared by the Antitoxin Laboratory of the University of Toronto. Considering that typhoid fever is endemic all over Canada, it is a remarkable tribute to the sanitary care of our troops that during the year 1916, there were but 167 cases of typhoid fever among the thousands of men concentrated in the country.

Inoculation and vaccination parades in this military district were regarded as of the utmost importance from both the military and medical viewpoint. They took precedence over all other parades and over all military training. Such parades were arranged for as soon as possible after a new unit was organized. Furthermore, it was found advantageous to have all inoculations and vaccinations carried out by the officers of one special unit. For this purpose in Medical Division No. 2, the Divisional Laboratory Unit was utilized. This unit consisted of several medical officers, usually four, two or three non-commissioned officers and a couple of men. Through the Assistant Director of Medical Service and General Staff Officer they arranged the inoculation and vaccination parades with the commanding officer of the unit. It was considered very desirable to have the entire unit paraded at the time, with band, if the unit possessed a band. Furthermore, the moral effect was excellent, if the band played during the time the inoculations and vaccinations were being done. Also it was found that when all officers, including the commissioned officers, were inoculated or vaccinated with the men of the unit, the commissioned officers coming up first, the example was of value. The men saw that everyone was playing the game.

No other protective inoculations of a voluntary or compulsory sort were carried out. During an outbreak of epidemic cerebrospinal meningitis the question of voluntary inoculation was considered, but it was not felt that such a procedure was of sufficient value to warrant its introduction until further evidence was forthcoming to demonstrate the desirability of so doing.

Laboratory Unit.—The laboratory unit, in addition to being responsible for the inoculations and vaccinations, carried on the routine work of a public health laboratory and also of a hospital clinical laboratory. This included the control of water supplies in summer camps, by means of bacteriological and chemical examinations. Such examinations were of course supplemented by surveys made by the sanitary officers of the district. Routine examinations of throat cultures for B. diphtheriæ, blood for Widal test, blood for Wassermann reaction, sputa for B. tuberculosis, smears for gonococci, urinalyses, investigation of gastric contents, and blood counts were made. The Laboratory unit was found to be of the very greatest service in the control of epidemic cerebrospinal meningitis. Officers of this unit, in addition to the sanitary officers, were competent to do lumbar punctures and administer anti-meningitis serum. This was considered especially necessary since the success in treatment so often depended upon early recognition and vigorous treatment as soon as the case was discovered. If necessary, an officer of the laboratory unit could, in coöperation with one of the sanitary officers, direct the entire treatment of the case, if the patient happened to be in billets or in a civilian hospital in a country district. The examination of cerebrospinal fluid from suspected cases and the examination of the swabs from the naso-pharynx of all patients and contacts was also carried out by the laboratory unit.

Since cooks, mess orderlies and kitchen fatigues are especially liable to transmit infection if they happen to be carriers, all such were paraded twice for naso-pharyngeal swabs, each fall when the troops went into winter quarters. Furthermore, it was especially emphasized that, as far as possible, mess orderlies and kitchen fatigues should not be changed too frequently. Two successive negative naso-pharyngeal swabs for meningococci were demanded in the case of all cooks, mess orderlies and men in kitchen fatigue. This, in combination with the sterilization of all dishes after each meal and the isolation of all immediate contacts when a case of epidemic meningitis occurred, were believed to be all that was necessary.

Meningococcus meningitis was observed both in its epidemic and sporadic forms. During the first few months of the war sixteen epidemic cases were seen and there were eight deaths. With the establishment of adequate measures of control, in the following year and a half, there were sixteen cases in the district with only two deaths.

Too much emphasis cannot be placed upon the necessity of having all medical officers on the lookout for cases of meningitis. Conferences were held, the most recent knowledge of disease was discussed by those familiar with it, precautions to be taken were outlined, and real team-work between medical officers of all units, officers of the laboratory unit and the sanitary officers arranged. Early recognition, prompt action, and careful supervision eliminates this disease, or at least completely minimizes its significance. Unless, however, medical officers are especially careful, cases will be overlooked, and entire units will be quarantined and military training seriously disturbed.

One other aspect of the question of meningitis is worthy of mention. In order that the serum used in the treatment of the cases of the disease be as effective as possible, cultures from every case were placed at the disposal of the University of Toronto, where the serum is prepared, in order that such cultures might be used in the immunization of the horses. A serum then was available covering all strains isolated from cases in the district. This plan undoubtedly insured a serum as satisfactory for treatment as it is possible to obtain at present. The horses producing the serum were also immunized with all the strains of meningococci in the collection of the Rockefeller Institute. This was possible through the courtesy and kindness of Doctor Flexner and Doctor Amoss.

Pneumonia.—Another important problem among transmissible diseases was that of lobar pneumonia. All such cases should be reported, isolated and treated as communicable. The laboratory unit undertook to determine the type of organism in order that serum treatment might be tried if cases due to type I organism were found. The casualties from lobar pneumonia among troops in training will be very considerable unless special care is taken. The problem of open cases of tuberculosis is not a serious one among enlisted men, if the medical officers responsible for the examination of recruits do their full duty, and if men are carefully reëxamined by medical boards two or three times before being allowed to proceed over seas.

Venereal Diseases.—One of the gravest problems remains to be dealt with, namely, that of venereal diseases. At the outset, it may be stated that a specialist Venereal Officer for the Military District was appointed and this meant that more effective cooperation was possible than could otherwise have been the case. The duties of this officer were to supervise treatment in the venereal section of the Base Hospital, to act with the Assistant Director of Medical Service and sanitary officers in carrying out all measures to control syphilis and gonorrhoea. Lectures to men, pamphlets, and all educational means elsewhere found to be of value, were used. The supervision of venereal parades, and of venereal prophylaxis were also duties of this officer. By carefully noting the rate of admissions from different units and by frequent conferences, much good was accomplished. There is still much that can be done in the control of these diseases but no single measure is, in the opinion of the writers, as important as the appointment of a venereal officer, whose duty it is to correlate prevention and treatment, to have a general oversight over the whole situation in the district in the matter of venereal diseases. This will, of course, include the closest possible coöperation with civilian authorities, as indeed should be the case with all communicable diseases so far mentioned. All cases of the ordinary communicable diseases, measles, mumps, scarlet fever, whooping-cough, etc., were treated in an isolation department of the Base Hospital. While troops were in barracks in a large center or population, daily reports were received from the local department of health with a list of all cases of communicable disease reported during the previous twenty-four hours with the street address, indicating where the case was being treated. Such addresses were then out of bounds for all troops, until the end of the quarantine period in each instance.

DIPHTHERIA.—A recent epidemic outbreak of wound diphtheria amongst returned men has been observed This was of considerable interest and is being reported more fully elsewhere (*Journal of the American Medical Association*). The outbreak was limited to returned men and it was found that these were suffering from diphtheritic infection when they landed in Canada from overseas. The usual methods for the control of diphtheria were found to be effective in checking the outbreak.

In a general way the control of communicable diseases amongst troops is often a more simple problem than the control of the same diseases in the civilian population. Education of all ranks, especially the non-commissioned officers in regard to the principal facts with regard to the way in which communicable diseases are spread is of the greatest importance. Also frequent conferences of medical officers of all units and sanitary officers, with the Assistant Director of Medical Service should be arranged at frequent intervals for the discussion of all sanitary questions. If this is done, a very much better understanding is arrived at and coöperation is effected which would otherwise be impossible. Of all the measures, after specific prophylaxis, education is the most significant.

In conclusion the writers may be permitted to quote a few sentences from the Cavendish Lecture by an officer of the Canadian Army Medical Corps, in London, during last month:

"The Medical Service, above all

other services, has done its perfect work. It has yielded an army without sickness. I have never seen a case of typhoid, and the few infectious cases are of the nature of children's diseases —measles, mumps, chicken-pox. For the first time, also, in the history of the world we have an army which is free from venereal disease."

"The Medical Service is no longer the poor relation of the army. By the miracle it has performed of keeping the army fit, the consideration accorded to the service is unbounded. New problems face it every day, problems that must be solved. Trench feet in the first and second winters were likely to cripple the army. Last winter the methods of prevention were so sure that a case of trench foot was a curiosity and brought stoppage of leave upon a battalion which produced them. Medical officers may not command; they advise. But he would be a rash commanding officer who would disregard advice repeatedly given."

THE FALLACY OF READING ACCURATELY GAS PERCENTAGES IN THE FERMENTATION OF LACTOSE PEPTONE BILE AND LACTOSE BROTH.

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The College of the City of New York.

THE use of lactose broth and lactose peptone bile as a "presumptive test" has been used most extensively during the last decade in the detection of the Bacillus coli group in the bacteriological examination of water, oysters, milk, and sewage effluents. It is a common practice to read gas productions in the fermentation and inverted vials very accurately sometimes to the fractional part of a unit, thus

33⅓ per cent.—B. coli group.
62 per cent.—B. coli group.
74 per cent.—B. coli group.

Of what values are the numbers, especially the fractions, to the left of the equal sign? From the data presented in this paper it was found that:

1. The following factors cause variations in the amounts of gas produced in lactose peptone bile and lactose broth:
    - a. Temperature.
    - b. Time of incubation.
    - c. Initial reaction of the culture medium.
    - d. Length of inverted vial.
    - e. Source of bile.
    - f. Absorption of formed gas.
2. The amount of gas produced in percentages varies in a given group within a wide range.

Since all these factors and possibly many other uncontrollable ones play a very important part in the final gas readings, which must necessarily vary considerably and since no real quantitative value can be assigned to any observation of gas production, it seems that accurate readings of gas percentages have no scientific justification in sanitary bacteriological analyses and that gas readings could be recorded just as conveniently and more scientifically by the positive (+) and negative (−) signs respectively.

GASOLINE ENGINE EXHAUST-GAS POISONING.

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THE gasoline motor and the poorly ventilated garage have brought with them instances of prostration and even death induced by intoxication from noxious gases emitted as exhaust gases from gasoline engines. Whenever an explosion is of moderate intensity and combustion incomplete, these gases may be formed in amounts far in excess of the amounts we have learned to consider the physiological standards of endurance. Burrell, Schumacher, Apfelbach, and others, have shown by analyses that the per cent. of carbon monoxid in exhaust gases varies from 2 to 25—averaging about 9 per cent.—while that of carbon dioxid varies from 3 to 24 per cent., both depending upon the quality of carburation and the bore and stroke of the engine. Haldane states that .05 per cent. carbon monoxid in pure air is just sufficient to produce in time very slight symptoms of poisoning in man; that 0.1 per cent. may cause a slight headache or palpitation of the heart in an hour or less; and that 0.2 per cent. is very dangerous. Burrell found in experiments upon himself that he became very sick for eight hours after exposure for twenty minutes to air containing 0.25 per cent. carbon monoxid. It is evident that great dilution of these gases must be brought about in order to render them harmless.

The Ohio State Department of Health has received a number of complaints and reports of exhaust gas intoxications, and in most instances investigations of these occurrences have been made by members of the department. In one instance a man whose son was employed in the engine testing department of an automobile factory complained that his son and three other young men had suffered from dizziness and extreme weakness at various times, and on one occasion were forced to be taken from the room, at which time they were seized with severe attacks of vomiting, together with vertigo, ringing in the ears, headache, general weakness and a slow, weak pulse. They were taken into the open air and gradually recovered and were able to return to work the second day thereafter. A number of cases of sudden death have also been reported, occurring, in most instances, in small private garages with windows and doors tightly closed. The term "petromortis" has been frequently used by the press as the cause of death in cases of this kind.

Probably the most striking instance of exhaust gas poisoning called to our attention occurred in a hotel in a small town in Western Ohio. The building was a two-story structure with a private electric plant, consisting of a generator and a 14 h. p. gasoline engine located in a small room in the basement. From the engine a three-inch exhaust pipe led out underground into an alley to a silencing drum made of two twenty-four-inch sewer tiles. From this drum the three-inch pipe continued and came to the surface about twenty feet from the building.

The engine was operated by the night clerk, who usually went to the engine room two or three times in an evening to see that oil cups were filled and everything running smoothly, and at twelve o'clock nightly he stopped the engine and closed the building. On the occasion of one visit to the engine room, he was seized with extreme dizziness and a great general weakness, especially noticeable in the lower extremities, and was forced to sit down and rest several times on the steps leading from the basement. He immediately sought the open air and in the course of half an hour had fully recovered. This same condition was repeated to a greater or less degree each time he visited the basement during the next few nights, and becoming alarmed about his condition he consulted a physician, who assured him that he had no heart affection or other organic trouble in so far as he was able to discover. About two weeks after he first noticed his trouble, he went to the engine room at twelve o'clock, as usual, and stopped the engine. While in the basement he became so dizzy that he could not stand and was forced to crawl on his hands and knees to the first floor. In attempting to ascend the first flight of stairs leading to the second floor, he became so dizzy, weak and short of breath, and a throbbing headache became so severe that he called for help and promptly lost consciousness. There were nineteen other persons in the hotel and as they came into the corridor (all on the second floor), they also became so weak and dizzy that they were forced to either sit or lie down. One man was able to reach a telephone and summon a physician, who decided that they had eaten poisoned food, and accordingly administered warm milk and other emetics, and later a large dose of epsom salts. All complained of practically the same symptoms, viz., dizziness, general muscular weakness, throbbing temporal headache, palpitation, and shortness of breath. Two were in a comatose condition, four complained of nausea, while in two instances there were evidences of relaxation of the sphincters. Although some were rather indisposed for a day or two, all recovered in a short time.

The following day an investigation was made of the cause of the wholesale poisoning. The gasoline engine was started and the five persons present in the engine room were conscious of dizziness, weakness and palpitation within a few minutes after the engine was started. The exhaust pipe was dug up and it was found that one sewer tile had given away and the silencing drum was almost completely filled with water and dirt. With an almost total occlusion of the exhaust pipe, practically the whole charge of gas was forced back into the small, poorly ventilated basement room, from which it found its way through the open stair door to the entire building.

Carbon monoxid, of course, was responsible for these cases of intoxication as it is for all cases of exhaust-gas poisoning. Being lighter than air, it permeated the building rapidly when the door was opened and reached the second floor in such concentration as to be poisonous in a very few seconds, notwithstanding the dilution that necessarily took place as the gas traveled through the three rooms on the first floor. Carbon monoxid is in no way a new poison, but the advent of the gasoline engine as a means of power and locomotion brings with it many curious opportunities for its poisonous effects.

The first consideration in the prevention of poisoning by gases emitted from the engine is adequate dilution. Authorities have agreed that the concentration of carbon monoxid in pure air must be kept below .05 per cent. if poisoning is to be prevented. Thus, if an ordinary gasoline motor running at moderate speed is capable of emitting 2.5 cubic feet of carbon monoxid per minute, approximately 1,500 cubic feet of pure air per minute would be required to keep the concentration below the danger mark. Gasoline engine manufacturers, motorists and others should keep this in mind in considering the question of ventilation of workrooms, garages, etc. The fact that cases have been reported to us of prostration in large factory rooms in automobile factories, would indicate that the danger is not confined to small garages, and the need of a thorough system of ventilation is evident. The odorless, colorless, and tasteless properties of the gas make unanticipated repeated exposures possible, and warrant wide recognition in the interests of hygiene.

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ARMY SANITARY SERVICE CREATED.

Secretary Baker has approved an order creating a sanitary corps under the Medical Department of the Army which will include various classes of experts in sanitation, bacteriology, sanitary engineering, and men skilled in the supply, transportation, storage, etc., in connection with Medical Department work.

The following quotation from the order will be of interest:

"The officers of said corps will be provided by assigning officers of the Medical Reserve Corps thereto, or by the appointment of citizens of the United States who are found under regulations established by the Secretary of War to possess special skill in sanitation, in sanitary engineering, in bacteriology or other sciences related to sanitation and preventive medicine, or who possess other knowledge of special advantage to the Medical Department."

Red Cross. The Red Cross has dispatched to Russia a Special Commission to lay plans for carrying on relief work in Russia on a large scale. Among the members are George C. Whipple, C.-E. A. Winslow and Henry J. Horn.

—*The Tech*, July 10, 1917.

THE DE-LOUSING MEASURES OF THE SANTE FÉ RAILWAY SYSTEM.

MARK F. BOYD,
Epidemiologist, Iowa State Board of Health.

FOLLOWING the introduction of typhus fever into Fort Madison, Iowa, by a Sante Fé section hand, only seven days out of El Paso, Texas, and the exposure of several unidentified Mexican laborers at various points along the road in Iowa and Illinois to infection originally introduced by this case, the chief surgeon of the Sante Fé, Dr. J. P. Kaster of Topeka, Kansas, promptly realized the danger and stated the Sante Fé would promptly execute any measures suggested by the epidemiologist of the Iowa State Board of Health.

The problem confronting the road was a serious one. Mexicans, many of whom are constantly arriving from along the border and old Mexico, constitute the chief unskilled labor employed by the road along its entire system. Most of these are housed in bunk cars or bunk car bodies upon the railroad property. These are sometimes grossly overcrowded and are entirely lacking in bathing facilities. The lack of opportunities for bathing is in no-wise disconcerting to the Mexicans, most of whom appear to have seldom utilized their opportunities in this direction even in their native land. As a result of this neglect of personal cleanliness many are infested with both head and body lice, and thus afford a suitable soil for the propagation of typhus.

Two classes of persons are endangered by an importation of typhus into their midst (1) those who themselves are infested with body lice, and (2) those whose daily or occasional activities bring them in contact with louse infested persons. Among the American population of Iowa typhus would never spread very far under the present standards of living, as louse infestation is very rare. But those whose duties bring them in contact with a more or less louse infested group of persons are exposed to some degree of danger in the presence of the disease. In this connection physicians, nurses, policemen and jailers are especially endangered. This was the situation in Fort Madison, Iowa and at other points on the Sante Fé where unrecognized contacts existed. In Fort Madison the Mexican colony numbered about 230, and small section crews were also stationed at New Boston and Argyle, Iowa.

The contemplated campaign of louse extermination among this Mexican population considered three things: (1) the de-lousing of the persons of the Mexicans themselves, (2) the delousing of their clothing, bedding and other intimate personal effects, and (3) the de-lousing of their bunks in the cars occupied by them. Since the necessity for this work existed at other points along the road than Iowa, the magnitude of the task was greatly increased. It appeared therefore that some portable equipment and system of operation must be devised which could be taken from place to place to accomplish this purpose. Time was pressing and the equipment must be such that it could be immediately constructed from materials on hand in the railroad shops, and the supplies those that could be drawn from those on hand in the railroad storehouse, and the help, the regular railroad employees.

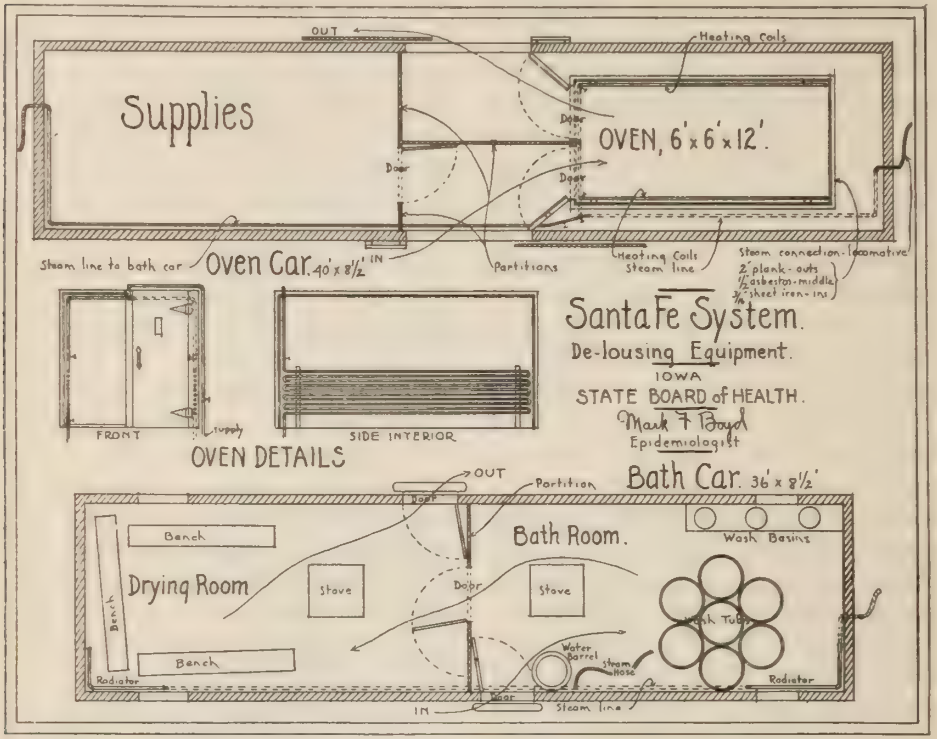

Fig. 1

It was decided to accomplish the de-lousing of the Mexicans themselves by a 10-minute bath in kerosene and soapsuds, with a kerosene and vinegar bath for the hair. Clothing, bedding, etc., was de-loused by exposure to a temperature in excess of 160° F. for twenty minutes. The sleeping quarters in the bunk cars were de-loused by spraying with kerosene. Dry heat was considered preferable for the destruction of lice in the clothing, as it could then be immediately returned to the men, hence saving time. Fumigation of the bunk cars did not seem practical, owing to their loose construction, and the length of time taken by such a process.

After the general plan of campaign was decided upon the details of construction were arranged in conference with the various officials of the Sante Fé shops at Fort Madison. Within forty-eight hours after the work of construction was started, the equipment was ready for use.

The heating of the clothing and bedding was accomplished in a large oven (6 feet x 6 feet x 12 feet inside dimensions) constructed in one end of a 70,000 pounds capacity steel under frame freight car. The outside wall of the oven consisted of two inch planks, which on the interior was lined with one-half inch asbestos, upon which was placed three-sixteenth inch (14 gauge) sheet iron. Double doors of similar construction were provided at the end, in the middle of the car. The interior of the oven was fitted with two radiators, containing a total of 240 feet of one and one-fourth inch pipe. Each radiator had ten pipes and was placed horizontally at the bottom of each wall. The plate shows the details of construction. The opposite end of the car was partitioned off to serve as a storeroom for supplies, and a longitudinal portion was placed from the storeroom to the front of the oven, preventing crossing the car except through the oven. This installation was accomplished at a cost of about $75. Heat was to be furnished the oven by the circulation of steam from the engine, next to which this car was placed, oven first. Steam was supplied by a passenger locomotive at a pressure of from 90 to 110 pounds. Freight engines are not equipped with connections for steam heating. The oven after closure would reach a temperature of 160° F. in from 10 to 30 minutes, depending upon the external temperature, whereupon, its "run" would be considered to have commenced. At the expiration of the "run" 20 minutes later, the temperature, read through a small window, upon a thermometer suspended on the inside of the door, varied from 190° F. to 200° F. A rack was provided for mattresses, low racks for bedding and hooks were provided in the ceiling from which clothing could be hung.

Two bath cars were provided, one for men and one for women and children. In the absence of women and children the second car was also used for men. These were constructed by running a partition across a bunk car, so that two rectangular rooms were formed, each provided with an external door, opening however on opposite sides of the car. A communicating door between each room was provided. One room was designed to serve as a bath room and one as a drying room. The walls of each room and the floor of the drying room was covered with building paper. A stove was installed in each room and a radiator was also installed in each. Three benches were provided in the drying room. In the wash room a small bench was installed for the wash basins. The car was fitted with steam connections for radiation and water heating. Water was kept in a barrel inside the door and was heated by turning steam into it through a rubber hose. The bath room was supplied with seven wash tubs for bathing purposes and three wash basins. This gave accommodations for six persons. The kerosene and soapsuds (equal parts) was placed in the central tub, the men standing in the other tubs and dipping out their bath water and kerosene with sponges. The construction of both bath cars was identical. The plan is shown in the plate previously referred to.

Since the operations were to be carried on among Mexicans most of whom understood but little English, some difficulty was apprehended because of their possible failure to understand the purpose of the work from the lack of a ready means of communication with them. It was concluded that an interpreter should accompany the train and that the de-lousing crew had best be Mexicans. This was done with the belief that after these men of the crew understood the nature of the work they could readily explain its nature to their countrymen and thus secure their intelligent coöperation. Happily the idea proved successful.

The following crew performed the work:

No. 1. Interpreter, Mexican. Explained to the occupants of a car what was to be done, later removed the contents of the oven and distributed the de-loused clothing to the naked men in the drying room of the bath car.

No. 2. Woman, Mexican. Attendant in woman's bath car. Wife of No. 1.

No. 3. Mexican. Attendant in man's bath car. It was the duty of Nos. 2 and 3 to see that all in the bath car thoroughly bathed themselves for ten minutes and washed their hair.

No. 4. Mexican, Oven attendant. Arranged the clothing and bedding loosely in the oven and carried the clothing of the occupants of the bath car from the bath car to the oven.

No. 5 and 6. Mexicans. Car delousers. Carried clothing and bedding from bunk cars to oven and sprayed kerosene onto the bunks. After delousing, the clothing and bedding was carried back to the bunk cars by the owners.

No. 7. Foreman, American.

The de-lousing crew were placed in a uniform of one-piece overalls, all the openings in which (neck, front, sides, wrists and ankles) were sealed with adhesive tape. Before sealing the wrist holes, cotton flannel gloves were pulled over the hands. The open portion of the shoes was also sealed. Rubber bathing caps were placed on the head. At the end of each day's work the crew took the de-lousing treatment themselves and their clothing was heated. A separate way car was provided for the crew in travelling.

The following equipment was requisitioned for the train:

12	galvanized iron washtubs
6	dozen sponges
1	dozen wash-basins
2	spray pumps
6	galvanized iron buckets
6	one-piece overalls, assorted sizes
1	dozen rolls adhesive tape
6	rubber bathing caps
6	pairs cotton flannel gloves, without gauntlets
2	brooms
2	mops
2	clean, empty barrels
2	one-half gallon measures
2	thermometers
6	cotton blankets
6	dozen bath towels (women)
6	dozen hand towels
	Gunny sacking for floor covering

The following supplies sufficed for

the bathing of about 150 Mexicans and the de-lousing of their quarters:

- 2 barrels kerosene
- 2 gallons vinegar
- 3 dozen cakes of soap
- 2 dozen rolls paper towels.

The train was so arranged that the right hand side (looking toward the engine) was the lousy side. Bedding and clothing was taken into the oven car on the right hand side, and the Mexicans entered the bath car on the right hand side. This was called the "lousy" side of the train. After heating the bedding and clothing were removed from the left side of the oven car. After bathing the Mexicans passed into the drying room, awaited the return of their clothing and when dressed departed from the left side. This was known as the "clean" side of the train. The arrangement of the train when in operation is shown in the small sketch.

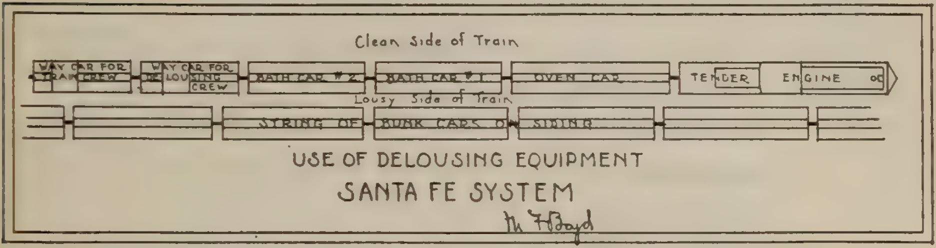

Fig. 2

The contents of each bunk car and its occupants were treated at one time. About two cars and twelve men could be handled in an hour, for each bath car.

A separate way car was provided for the train crew. The train was thus made up of five cars.

The foreman of each crew of Mexicans had them at their bunk cars when the arrival of the train was expected. They were checked off from the time book, and after bathing the name of each was recorded and a numbered de-lousing certificate issued to him. The local police kept all Mexicans off the streets who could not produce this certificate, and Sante Fé employees at other points were instructed to refuse employment to any Mexicans from Fort Madison who could not produce a certificate.

All the Mexicans gave their most active coöperation and no difficulty was experienced with any. Most seemed glad of an opportunity to take a bath, despite the dose of kerosene. After the spraying of the bunk cars all the Mexicans were warned to be careful with fire and no accidents followed its use in the bunk cars.

The Sante Fé officials have been so well satisfied with the practical nature of the equipment that four trains are now in operation, in Illinois, Iowa, Missouri and Kansas.

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PROFESSOR GUNN DEPARTS FOR FRANCE.

An Editorial by President W. A. Evans.

The American Public Health Association has been called upon to make a sacrifice in behalf of the sufferers in France. Our secretary and editor, Prof. S. M. Gunn, was asked to join the Tuberculosis Commission which the International Health Board has sent to France. The other members of this Commission are Dr. Livingston Farrand, Director, and Mr. Homer Folks, members of our Association, and Dr. J. A. Miller.

Professor Gunn's brothers have been at the front since the war began, and he has felt all along that the time would come, when he must do his bit. When he asked for a leave of absence we felt that however much his going might cripple us, if he felt it to be his duty to go, it was our duty to agree to his going.

Various members of our association have taken up duties in connection with the war for which they have been called by governments and philanthropic bodies. As the needs develop, others will go. Before the war ends I am sure a large part of our membership will have been called upon to render the services for which their training peculiarly fits them.

Professor Gunn's example will stimulate other patriotic, highly trained men to follow, but no commission will have a greater or a more humane task than this one. No task has had a better commission than this one of which our secretary is a member and our former editor is the chairman.

In the language of the heroes who go over the top, we bid them "good-bye and good luck."

We are fortunate in that Professor Gunn secured for his successor until the next annual meeting, Mr. A. W. Hedrich, who for a year has been acting as Editorial Assistant. Mr. Hedrich is active, energetic, able, and I am sure that he will have the support of the membership. *W. A. Evans.*

ANNOUNCEMENT—CHANGE OF ANNUAL MEETING.

On account of conditions engendered by the war the Executive Committee has decided to change the time and place of the Annual Meeting. When New Orleans became aware of the advantage to the country and to the Association of a meeting this fall in Washington, D. C., they readily agreed to the change on condition that we would come there when conditions in the country again became normal.

The central theme of this meeting will be the welfare of the soldier, sailor, and civilian in time of war.

The officers of each Section are asked to shape their programs so that they will bear as much as possible on the main theme. Details as to meeting, places, section headquarters, etc., will appear shortly.

The members are advised to secure their hotel accommodations in advance.

The dates of meeting are tentatively announced as October 17, 18, 19 and 20. Section heads will please notify the Acting Secretary as soon as possible of the number of sessions required, and to indicate the proposed Section programs before September 1st.

W. A. Evans.

A NOTICE TO AUTHORS.

A number of conditions have conspired to cause an accumulation of manuscripts in the office of the JOURNAL:

The war has increased the cost of publishing, while decreasing revenues. For this reason, the Executive Committee several months ago limited the budget of the JOURNAL to such an extent that it was necessary to cut down the number of pages of reading matter to an extent noticeable to every observant reader. The war has likewise created the necessity of publishing a number of articles on this all-important subject, and these have naturally taken the place of papers read at the last annual meeting.

Finally, the advancement of the date of the annual meeting decreases the space for publication of the manuscripts on hand by two whole issues since it is imperative that the papers read at the prospective meeting at Washington, D. C., dealing with problems of the war be printed at once.

As a result of these conditions there are on hand at least four times as many manuscripts as can be published within a reasonable length of time. It is exceedingly unfortunate that the readers of the JOURNAL should be deprived of these valuable contributions, and one is tempted to hold them in the hope that it might be possible to print them later. The possibility of such good fortune is so remote, however, that it is only fair to the authors,—especially of long articles,—to lay the situation frankly before them in order that they may recall their manuscripts for publication elsewhere.

SANITARY SERVICE IN THE WAR.

The Sanitary Reserve bill, regarding which we wrote in the June number of the JOURNAL, has passed the Senate and as we go to press is pending before the House.

"I understand," writes our correspondent in Washington, "that there are likely to be material changes in the form of the bill before it is enacted, and therefore anything I might write you now would be of little service."

Press announcements relating to sanitary service appear on pages 666 and 697 of this issue.

For the benefit of those who filed answers to the A. P. H. A. war service questionnaires, the Acting Secretary wishes to announce that these applications have been filed with the Medical Division, advisory Council of Defense, Washington, D. C.

AN IMPORTANT ALLY FOR THE PUBLIC HEALTH MOVEMENT.

Experts agree that there is a lamentable discrepancy between the state of our public health knowledge and the practical application of this knowledge in our cities and towns. Probably 400,000 persons die from avoidable causes in our country each year—there are 200,000 cases of typhoid fever alone—yet a comparatively small proportion of our cities have full-time health officers and the average health department appropriation is most inadequate. Even in the fundamental matter of death registration our records are reasonably complete for only two-thirds of the country.

Under these circumstances we should welcome the innovation represented by the Seventh Baby Campaign recently launched by the *Delineator* magazine. In brief, the magazine proposes to make its leading policy a carefully-planned and coherent series of articles and special stories which shall bring home, in attractive form, the facts regarding health work which people should know. At the same time, to render local service and concrete advice regarding particular problems, the magazine has gathered a working force of public health nurses, laboratory men, and sanitarians; and has selected infant mortality as the first rallying point of the campaign.

In interested cities and towns, between 10,000 and 40,000 population, the magazine is prepared to make, and is making, expert studies of infant mortality and the conditions affecting it, with corresponding programs to meet the local situations, not merely with regard to infant mortality, but with regard to public health work in general. In connection with these surveys active educational campaigns are carried on by means of newspaper stories, moving pictures, talks, and specially-prepared travelling exhibits. In addition, local committees are formed with reference to the different subjects of the investigation, so as to bring as many local persons as possible in touch with the work and to secure their permanent interest in their community health problems. Two travelling laboratories have been equipped and a sufficient field force has been gathered to make 50 surveys a year. The whole enterprise is in competent hands, being directed by Dr. C. E. Terry, formerly Health Officer of Jacksonville, Fla., as Health Editor, and Franz Schneider, Jr., formerly of the Russell Sage Foundation, as Associate Health Editor. The service is offered free, the only conditions being proper auspices and living expenses for a nurse.

That such a magazine has faith in its readers' interest in their community health and will commit itself to a definite health policy on such an extensive and expensive scale is an interesting and encouraging sign of the times. It reminds us that the prestige of our movement is gaining strength. From the situation of but a few years ago when a few sanitary prophets, despised as fanatics, were howling in the wilderness, we have arrived at a point where life insurance companies see a profit in expenditures for health education, where industrial concerns are beginning to understand that health work is good business, and where business interests will support museums of safety and sanitation.

If the fundamental assumption that readers can be interested in their community health is justified by the results of this campaign, it seems reasonable to believe that the scope of this kind of magazine work can be greatly broadened. Let us hope that this experiment is the beginning of a process by which the tremendous educational possibilities of our family magazines shall be developed and harnessed to constructive work for the common welfare.

SAVING SIGHT—SAVING CITIZENS.

EDWARD M. VAN CLEVE,
Managing Director, National Committee for the Prevention of Blindness.

Read before the General Sessions, American Public Health Association, Cincinnati, Ohio, October 27, 1916.

THE sibilant alliteration, "Saving Sight—Saving Citizens," indicated the purpose of an effort begun eight years ago by the Ohio Commission for the Blind, following the lead of the movement undertaken by the American Medical Association in 1906. It was my privilege to act as voice of the Commission for its first three years and I selected the words of my subject with the aim not only of attracting attention but of pointing out a serious condition and a proposed plan for meeting it. The fact is that few people knew that half of all blindness is preventable; it was our purpose first of all to advertise the condition and then provide means for avoiding needless loss of the most valuable of the senses. More and more effectively in these latter years, after the appointment of paid workers to carry on the movement, the Ohio public has been taught this truth of the preventableness of much blindness and today some millions of the state's inhabitants are not so ignorant as they were in 1908, though there are millions more still to be reached.

To save citizens—that is, effective, competent, unhandicapped citizens—is sufficient justification for making this effort a state function. And so the appeal has been made to spare the purse of the commonwealth by cutting off at its source the supply of children to be educated at large expense, and adults to be helped because blind, but needlessly so. For conservative estimates have been made by those best qualified by their special information to make them which show that for every child we allow to go blind the state is practically sure to spend from $4,000 to $8,000, the variation in amount depending upon the extent to which the education he received and his native ability render him self-supporting after reaching adult years. By actual count I found the state of Ohio was spending more than $25,000 a year in the education and maintenance at the state school of pupils blinded by one disease alone—and that the infection which doctors know can be prevented in almost 100 per cent. of the cases of its occurrence.

But the worker in the field of prevention of blindness, in common with other workers for the benefit of mankind, is not influenced so much by the obligation to save dollars to the state and to society as he is by the appeal of a misfortune to the individual that is in many cases to him and to his friends a calamity. No one can stand at the doors of our schools for the sightless and watch the steady procession of needlessly blind boys and girls coming, coming, still coming, without a deep pity for these unfortunate victims of ignorance, carelessness, and indifference—a pity which soon becomes indignation and a burning desire to stop it; no one, I say, unless he, too, is ignorant, careless, indifferent. To interest the American Public Health Association in such a movement as the one for conservation of vision should not be difficult, for health officers, sanitarians, publicists, humanitarians are not careless, nor indifferent, and one would hardly dare ascribe ignorance to these chosen spirits.

How to go about the work of reducing blindness to its sad lowest terms is a practical problem for whose solution the National Committee for the Prevention of Blindness has been organized. Its purposes and aims are:

1. To endeavor to ascertain, through study and investigation, any causes, whether direct or indirect, which may result in blindness or impaired vision.
2. To advocate measures which shall lead to the elimination of such causes.
3. To disseminate knowledge concerning all matters pertaining to the care and use of the eyes.

The third object is the one which at the present stage of its life the Committee is endeavoring to reach, for by dissemination of knowledge alone can we hope to overcome the results of ignorance. To this end printed matter giving the most authoritative information on the subject is prepared, lectures and lantern slides for illustration are available, and both by personal service and by correspondence the Committee is helping the men and women who are solving the problem. Health officers and their staff of nurses, the visiting nurse associations, the superintendents of schools for the blind, women's clubs, individuals to whom has come the opportunity are bringing the facts to public attention and bringing the means of prevention to unfortunate victims. For these the Committee acts as a bureau of information and interchange of experience.

Naturally, the first object of attack is ophthalmia neonatorum, the disease which in 1915 sent more than two hundred children to enter for the first time the schools for the sightless in the United States. It is the cause for the presence of about one fourth of all the pupils in these schools. As long as an inflammation in the eyes of the newborn is considered a matter of no moment,—"Every baby has sore eyes," says the ignorant old-wife nurse too frequently responsible for the care of the new babies—as long as criminally ignorant professional midwives are permitted to practise, as long as criminally careless doctors have not the time or the inclination to take the needful precautions, as long as gonorrhea is looked on as a harmless infliction no worse than a cold, as long as physicians in families where the suspected presence of gonorrheal infection would be an affront are still unwilling to believe that ophthalmia is often caused by other germs and will not apply a prophylactic as a routine precautionary measure—so long will we have blind babies doomed to go through life with scarred or lost eyes which might have been saved. Let the mothers of babies know that there may come to them such a calamity and let them know that prevention is possible and some reduction of the needlessly blind is bound to occur. Laws to bring about reporting and remedial measures in cases of ophthalmia neonatorum, some of them lame and ineffective and some unenforced, are on the statute books of 37 states; the enforcement and improvement of these laws and the agitation connected therewith are very helpful in this cause. In some localities effective coöperation between the the public health authorities and all private agencies leaves little to be desired in the carrying out of the best known means to prevent blindness from ophthalmia neonatorum. It can be prevented, the means are well-known. It should be as much a matter of pride for a city health department to announce that no blindness has occurred from neglect as to publish with self-gratulation that typhoid fever has claimed no victims in the district.

Trachoma is a menace not only in eastern Kentucky and its neighborhood and in the Indian reservations but it prevails in a much larger field than is generally known. The United States Public Health Service has done and is doing a great work in stamping out the disease where found in most alarming prevalence. We must secure much more general knowledge of the danger there is in impairment of vision from neglect in cases of trachoma, and coöperation of sanitarians and health officers to compel cleanliness where it is lacking in order to offer no field in which trachoma may flourish. Dr. J. A. Stucky's record as an unofficial investigator and a worker for the eradication of the disease of trachoma in Kentucky is known nationally and he has consented to come and give to this body some report of his experiences.

While ophthalmia neonatorum and trachoma are the two principal eye diseases with which the public officials of the Association have to deal, the education of the public to know that inherited syphilis is taking a toll of blindness in addition to the other calamities it brings, that some diseases of childhood bring loss of vision and that so-called "accidents" which cause children to be blinded are avoidable, together with other causes of impairment of vision in both children and adults, is the business of every health officer, sanitarian, humanitarian. One of the most encouraging movements of recent years is the establishment of social service departments in our great hospitals. It is only a new venture but the results in the special department of conservation of vision are most encouraging and point the way to the need of extension of such service.

In one other field of activity of the National Committee for the Prevention of Blindness this Association will doubtless take deep interest. Another interesting and hopeful movement is that for general, frequent, careful examination of the eyes of the young in public and private schools for the discovery and correction of ocular defects. Among the results of this inspection one of the most valuable is the establishment of classes for children of partial sight, with special appliances and methods particularly adapted to the instruction of these young people. They are not blind, in the true sense of the word, yet they are not capable of doing in the regular way the work done in classes of unhandicapped children. Massachusetts has made a most careful study of the situation and classes for such children have been or are about to be established in five cities of that state. New York City has several centers for sight-saving classes. Here in Ohio, in Cleveland, Toledo, and especially here in Cincinnati, conservation of vision classes are in operation. Dr. Wm. H. Peters has had a good deal to do with the inspection of the children in the public schools and the formation of these classes in Cincinnati and will give an account of his efforts in these matters.

Because people with the hurt of pity in their hearts, pity that innocent children were being given a heritage, thru neglect and careless indifference, of a life-long handicap, were stirred to seek a means of preventing such loss, stirred to some action that would save our people from the results of ignorance, this National Committee for the Prevention of Blindness was formed. The deep sentiment of human helpfulness—it stirred Dr. Lucien Howe of Buffalo to secure the legislative acts of 25 years ago and call public attention to facts that were unknown, and after him that other Buffalonian, physician and publicist, Dr. F. Park Lewis, to arouse his profession to be a force for popular education, head of the Committee on Conservation of Vision of the Amerian Medical Association, and to him succeeded as chairman of this section of the Council on Health and Public Instruction the vigorous and earnest Dr. Frank Allport of Chicago; it was a sense of the privilege of helping a singularly helpless people that induced that friend of the Kentucky mountaineers, Miss Linda Neville, to spend her days and nights in a noble service; it was this deep sense of pitiful indignation that children who need not have gone blind were being permitted thru ignorance to lose their vision and of determination that it must not be, which stirred to action that modest, noble woman, Miss Louisa Lee Schuyler, Doctor of Laws (the only woman to receive such degree from Columbia University), philanthropist, to inaugurate with the help of physicians this lay movement for the education of the public to prevent needless blindness.

It will not answer to keep all knowledge of how to help human ills or to avoid them as the occult secrets of a profession. Nor is it all sufficient that these be decorously proclaimed in assemblies of the educated and the elect. Press and public speaker, officer of the public health and nurse of the settlement, and every friend of the cause must become teachers of the facts. And some must shout the truth if ever it will be heard. In that terrible arraignment of modern society, Brieux's "Damaged Goods," a society which excuses its "conspiracy of silence" about the dread disease of syphilis with a futile "I did not know," the leading character is made to say, "If I could, I would cry it aloud from the housetops." And so it is the duty and the privilege of all of us who are engaged in this important educational movement to obey in our day the command which came in his day to the prophet Isaiah, to "cry aloud, spare not, lift up the voice like a trumpet."

I invite the members of this great American Public Health Association to coöperate with the National Committee for the Prevention of Blindness in the earnest effort now being made to spread the gospel of saving sight.

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ACTIVATED SLUDGE EXPERIMENTS AT THE UNIVERSITY OF ILLINOIS.

Edward Bartow, F. W. Mohlman and J. F. Schnellbach.

(Abstract, see Eng. News *76*, 972-3, 1916.)

The first series of experiments at the University of Illinois, begun November 1, 1914, was conducted in three-gallon bottles. The second series was conducted in a tank 9 inches square and 4½ feet deep. The third series was conducted in four tanks each having an area of 10 square feet and a depth of 9 feet. Experiments in the first three series were carried on by the fill and draw plan. The fourth series is being conducted with a continuous flow.* The sewage is pumped from the main outlet sewer of the city of Champaign to a grit chamber, from which it flows into an aeration chamber, divided longitudinally by 3 baffles into 4 compartments.

The lower part of each compartment has sides sloping towards the center, to a channel 10½ inches wide and 4 inches deep extending lengthwise through the tank. Above this channel Filtros plates are supported on T-bars that have been imbedded in the concrete.

The aerated sewage and sludge flows from the aeration chamber to the settling chamber. In order to assist the settling of the sludge, the liquid is passed down through the center and up around the edges of a hollow wooden frustum of a pyramid placed in the center of the settling tank. From the settling tank the effluent flows over a weir to the creek or into a pond, formed by two dams placed across the abandoned bed of a small stream.

The sludge is withdrawn from the settling chamber by an air lift and can be discharged into the raw sewage where it enters the aeration chamber, or can be diverted for experimental purposes, or to the sewer.

No special effort was necessary to build up activated sludge. The plant has simply been put into operation, allowing the effluent from the settling chamber to escape while pumping back the sediment. From the start 90 per cent. of the suspended matter was removed and after 13 days of operation stable effluents were obtained.

The results obtained have been very gratifying. Purification is indicated by the presence of from 5 to 8 parts per million of dissolved oxygen and the stability to methylene blue of from 5 to 15 days. The effluent is odorless, and generally clear, though at times, because of the insufficient capacity of the settling chamber, it contains small particles of sludge.

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* Eng. News, *42*, 111, 1899.

REPORT OF COMMITTEE ON SEWAGE WORKS OPERATION AND ANALYTICAL METHODS TO THE SANITARY ENGINEERING SECTION OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.*

YOUR committee has made two reports relative to the principles of operation and recommending analytical tests for use in connection with sewage treatment works. It appears advisable to review certain features of these prior reports before proceeding with the matter of state supervision over sewage works operation which is the subject of this report.

The purposes of sewage treatment are:

(a) "To promote the comfort and convenience of the people by maintaining water courses in a decently clean condition, *i. e.*, free from nuisance to sight or smell so as to be fit for civic development, industry and recreation.

(b) "To aid in protecting the public health, when necessary, by maintaining water courses as fit sources of water supply after adequate purification or for the cultivation of shell fish."

The operation of sewage treatment works may be judged by the following standards:

(a) "Prevention of nuisance either at the works or in the body of water receiving the effluent.

(b) "Protection to the public health, *e. g.*, in reducing the pollution in a water course to relieve the load on a water purification plant."

Due to the many forces of nature utilized in sewage treatment and the heterogeneous composition of sewage, it is self-evident that the operation of sewage treatment works cannot be made automatic but requires observation and supervision by trained, skilled operators at more or less frequent intervals, in order to accomplish the purpose for which the plant was installed and the funds invested.

Table No. 1 of analytical tests was submitted by the committee in 1914* and their use, when possible, is again urgently recommended.

It is recognized that in a great number of small works, the purpose of which is primarily to prevent the creation of nuisance, only the simplest tests are practical under present conditions and it is recommended that in such cases samples of the final effluent be incubated at room temperature with methylene blue and record kept of the number of days the samples retain their blue color. The required degree of stability depends largely upon the conditions in the receiving body of water. Where stability is demanded, on account of the dilution afforded being small, the samples of the effluent should retain their blue color at least ten or twelve days at room temperature or five or six days if incubated at 37° C.

Attention is again called to the importance in selecting analytical tests for sewage works, to the fact that changes in methods of operation and records for comparison are the primary purposes of this work and the acquirement of mere academic information, while interesting, is energy wasted which could better be expended in other directions.

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* Presented at the Cincinnati Meeting, October, 1916.

* See this Journal, Vol. V, No. 9, Sept. 1915, p. 936.

Considering the number of municipal sewage treatment works in America, it is surprising to learn how few are subject to laboratory control; but the newer plants are being so equipped and show the growing appreciation of the economy of proper operation.

Another very noticeable defect in the design of a large percentage of works is the complete absence of any method of determining the amount of sewage treated. This is of prime importance to successful operation, for otherwise retention in tanks and rates on filters are indeterminate and it is difficult, if not impossible, to know whether unsatisfactory results are due to overloading of the parts of the works or to improper methods of operation.

Where a fall is available a weir, preferably with an automatic recording device, is a simple and inexpensive method to use. Where the sewage has to be pumped, the venturi meter has proven successful. In works having a dosing tank, an approximation of the rate of flow may be obtained by the use of a float actuated counter, which indicates the number of discharges of the dosing tank. In the case of heavy flow, when a considerable amount of sewage runs in while the tank is discharging, the total discharge may be obtained by the following formula:

$$D=(n+\frac{ne}{f})v$$

in which D = total discharge in unit of time; n = number of discharges in the same unit of time; e = time of emptying; f = time of filling; v = volume of dosing tank.

When e is very small as compared with f, then $\frac{ne}{f}$ may be omitted and $D=nv$.

Your committee in its report last year called attention to the fact that "as the great majority of sewage treatment plants in America are small and frequently widely separated, it is apparent that the needed expert supervision cannot be obtained locally and that efficiency of operation can only be obtained through some central authority."

In some states, associations of those interested consisting of sewage works superintendents, state engineers and others are now being formed to hold meetings periodically to discuss practical questions on operation. The formation of such bodies and their frequent gatherings are highly recommended by your committee. Such meetings stimulate interest and are sources of information to many.

One of our correspondents stated:

"We suffer greatly in this state because of unskillful operation of sewage treatment plants. Some of our plants receive almost no attention. In other cases, services are employed, but they are either inadequate or inefficient."

The State Boards of Health are the logical bodies to provide this supervision, due to their uniform relation to all the municipalities in each state and with similar boards in adjacent states.

Furthermore, the sanitary disposal

STATE	OFFICER FURNISHING DATA		POPULATION OF STATE IN 1910	NUMBER OF WORKS IN STATE				NUMBER OF WORKS WITH LABORATORY	STATE BOARD OR DEPARTMENT OF HEALTH				
	NAME	TITLE		TOTAL NUMBER	FOR POPULATION OF				REQUIRES APPROVAL OF PLANS FOR SEWAGE PRIOR TO CONSTRUCTION.	EXERCISES SUPERVISION OVER OPERATION.	MAKES INSPECTION.	MAKES ANALYSES OF SEWAGE AND EFFLUENT.	RECEIVES REPORTS OF OPERATION.
					25 TO 500	500 TO 10,000	OVER 10,000						
CALIFORNIA	C.G.GILLESPIE	CHF. ENGR.	2,377,500	100 ±	NUMEROUS	90	3	0	YES	YES	OCCASIONALLY	YES	HAVE POWER NOT YET
ILLINOIS	P.HANSEN	CHF. ENGR.	5,638,600	75	4	61	10	0	YES	NOT YET	NOT YET	BY STATE WATER SURVEY	RULE PASSED NOT YET
IOWA	L.HIGGINS	SAN. ENGR.	2,224,800	85	1	82	2	2	YES	TO SOME EXTENT	YES	YES	YES AFTER JAN. 1 1917
KANSAS	C.A.HASKINS	CHF. ENGR.	1,690,900	67	9	53	5	0	YES	YES	YES	YES	JUST INSTALLED
MARYLAND	R.B.MORSE	CHF. ENGR.	1,295,300	13	0 (c)	12	1	1	YES	YES	YES	YES	NOT YET
MASS.	X.H.GOODNOUGH	CHF. ENGR.	3,366,400	58+	34+	11	13	3	YES	YES	YES	YES	YES
MICHIGAN	E.D.RICH	STATE SAN. ENGR.	2,810,200	38	22	14	2	0	NO	YES	YES	SOMETIMES	SOON
MINNESOTA	H.A.WITTAKER	DIRECTOR	2,075,700	79	44	32	3	0	NO LAW BUT NEARLY ALL SUBMIT PLANS	TO SOME EXTENT	YES	YES	NO
NEW JERSEY	C.G.WIGLEY	CHIEF BUR. OF ENGR.	2,537,200	168 (a)	66	89	13	2	YES	YES	YES	YES	SOON
NEW YORK	T.HORTON	CHF. ENGR.	9,113,600	178	73	90	15		YES	PARTIAL	YES	YES	IN SOME INSTANCES
OHIO	W.H.DITTOE	CHF. ENGR.	4,767,100	162	92	64	6	1 (d)	YES	YES	YES	YES	NO
PENN.	C.A.EMERSON JR.	CHF. ENGR.	7,665,100	117	61	47	9	17 32 PARTIAL	YES	YES	YES	YES	YES
TEXAS	V.M.EHLERS	SAN. ENGR.	3,896,500	40	2	37	1	2	NO LAW-MAJORITY SUBMIT PLANS	STANDARDS REQUIRED	YES	YES	YES
VIRGINIA	R.MESSER	SAN. ENGR.	2,061,600	44	22	22	0	1	NO LAW BUT PLANS PASSED ON	NO LAW BUT SUPERVISED	YES	NO	NO
WISCONSIN	W.G.KIRCHOFFER	SAN. ENGR.	2,333,800	70 ±	0	60 ±	10 ±	0	YES	YES	YES	YES	NO
			TOTALS	1294	437	764	93						
			PERCENT	100	34	59	7						

(a) 15 Trade wastes plants, etc., not included.

(b) Some cities have more than one plant, hence total number is 81.

(c) Many small institutional plants not included.

(d) 4 Additional laboratories planned for.

TABLE NO. 2 ACCOMPANYING 1916 REPORT OF COMMITTEE ON SEWAGE WORKS OPERATION AND ANALYTICAL METHODS, AMERICAN PUBLIC HEALTH ASSOCIATION.

of sewage is a matter generally affecting the commonwealth more than the individual community. The state is interested in requiring that sewage treatment works accomplish the best results possible, while the separate communities are naturally anxious that the works shall meet the requirements at the minimum expense for operation, additions and renewals.

It may be assumed, therefore, as an axiomatic statement, that for the good of the commonwealth, the municipalities and private owners, any procedure which will accomplish the above conditions is worthy of careful study and adoption.

During the past year, your committee has been corresponding with the sanitary engineers of the various State Boards and Departments of Health to obtain their views on our last year's report and their present and proposed procedure relative to control over the installation and operation of sewage treatment works.

For the purpose of this report, we have divided the forty-eight State Boards of Health in the United States into three groups as follows:

(a) Those states whose Boards of Health either have no engineer upon their staff, or have no specific legislation giving them control over the disposal of sewage, or have so few sewage treatment works under their jurisdiction that the subject is negligible. These twenty-four states in 1910 had a population of over 24,250,000, or 26 per cent. of the total population of the United States, and are:

Alabama, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, South Carolina, Tennessee, Utah, Washington, West Virginia, Wyoming.

(b) Those states whose Boards of Health have an engineer or other officer charged with supervision over disposal of sewage, but whose legal powers are limited and the number of sewage treatment works are small. The officers of this group of states have all signified their willingness to coöperate with your committee and have furnished valuable data.

These nine states in 1910 had a population of 12,753,000, or 14 per cent. of the total population of the United States, and are:

Connecticut, Florida, Indiana, Kentucky, Louisiana, Maine, New Hampshire, North Carolina, Rhode Island, Vermont.

(c) The remaining fifteen states have Boards of Health with engineering divisions and either have legal authority or otherwise exercise control over the disposal of sewage and operation of sewage treatment works. The 1910 population in these states was about 54,000,000, or 60 per cent. of the total population of the United States.

The conditions in these states are given in Table No. 2, from which it will be seen that, generally, sewerage plans must be approved before construction and supervision, inspection and analyses are made and in some reports of operation are made to the State Board of Health.

The approval of plans for sewerage projects by the commonwealth is of great advantage to the community, institution or individual about to expend funds for the construction of sewers or sewage treatment works; for it assures the carrying out of the work along comprehensive lines, which ultimately is economy, prevents the construction of illy or improperly designed works, and tends to uniformity of practice throughout the state.

The supervision over operation and inspection of sewage treatment works by the state in cases where works are efficiently operated becomes an endorsement more than anything else. In the case of the smaller works, which are frequently placed in charge of untrained and technically deficient operators, state supervision not only protects the commonwealth but makes possible the performance of the functions of the works for which they were designed and the funds invested.

To give concrete example, one of our correspondents wrote:

"The greatest difficulty is in the small city where the city surveyor is responsible for the operation and whose term of office is short and uncertain. There necessity for close observation by the State Board of Health is urgent."

And another stated:

"Our municipal sewage plants . . . have had practically no supervision either by the State Board of Health or by local authorities. Many of our municipalities seem to think that after a sewage disposal plant has been installed they have finished their obligations. We have even found cases where the local authorities were doubtful as to the location of the plant."

It will be noted in Table No. 2 that commonwealths representing more than half the population of the United States have given their State Boards of Health these powers, but it will be further noted that at the present time only in Massachusetts, Pennsylvania and Texas is the operation of the sewage treatment works regularly reported to the state officials. Several other states are preparing to inaugurate this means of exercising supervision, and your committee therefore deems the time ripe for a thorough discussion of these matters in the hope that from it those state engineers who are planning to put such a system into practice may obtain helpful suggestions from the experience of others and that State Boards of Health not now clothed with sufficient powers to protect and aid their citizens properly may succeed in obtaining legislation to that end.

Submission of Sewerage Plans for State Approval.

Prior to contracts being made for the construction of sewerage works (sewers, pumping stations, or treatment works), plans of the same should be submitted to the State Board or Department of Health for examination, and, if satisfactory, approved.

The examination should include a determination of comformity to a comprehensive plan proper for future conditions even though in many cases it may not be necessary to construct, at first, any more than part of the sewer system and only provide for preliminary treatment of sewage.

The adoption of a comprehensive plan, if only in outline, assures the future utilization of each part of the entire project as built.

The examination of the plans submitted should also include the fitness of the design and types of treatment to produce the quality of effluent demanded by the conditions of the receiving body of water. For example, it is unjust and a waste of public funds to approve, without comment, a complete treatment works for sewage to be discharged into a receiving body of water where neither the public health nor aesthetic conditions require at the present time more than preliminary treatment.

In the interest of economy of both public and private funds, it is most desirable to obtain coöperation between designing engineers and the state officials especially during the preparation of the preliminary plans. For example, take the case where, in accordance with an order of the state officers, the engineers of a town are beginning the studies needed to prepare the preliminary plans; if, by conference between the officers of the state and of the town, a decision could be reached that in order to protect shell fish beds clarification and disinfection only would be required, the designing engineers at the minimum expense could select types of processes to meet only these requirements, rather than make studies for submission to the state in ignorance of the policy adopted by the commonwealth for that stream or part of the stream.

This coöperation between the separate communities and the commonwealth also avoids delays in final approval and there would be greater assurance of approval without requirement of changes in the final plans which cause delay in construction and needless expense to the applicants.

The plans as approved should be filed with the state and no material deviation in design permitted without state approval.

Subsequent additions or changes in construction should likewise be approved and filed.

In addition to the obvious advantages to all concerned, this procedure provides the state with correct plans of all the sewerage works within its jurisdiction which are needed for proper supervision of operation.

SUPERVISION OF OPERATION.

Upon completion of the construction of sewage treatment works it very frequently happens that the operation is intrusted to persons entirely unfamiliar with the intent and purpose of the designer. It is particularly important that early operation, where adjustment of parts must be made to meet unanticipated conditions, should be intrusted to either the designer or some engineer familiar with all the intricacies of operation. This provision can be met by a requirement in the permit of approval issued by the state for the construction of the works.

An examination of Table No. 2 shows that over one-third of the plants given therein are designed for populations of less than 500, over one-half for populations between 500 and 10,000, and only 7 per cent. for populations over 10,000.

Generally, only cities at the present time can afford to provide expert operators for sewage works and the percentages given strongly confirm the statements in last year's report relative to the need for state supervision over operation.

In justice to the larger cities, it should be borne in mind, however, that most of the large cities of this country are situated upon large rivers or great bodies of quiescent water, so that up to a short time ago the necessity for sewage treatment was not fully realized. Many of these municipalities have spent great sums for sewer systems with but little thought of the question of sewage treatment, so that the interception of the sewage and its transportation to treatment works, together with changes necessary in the existing system, requires detailed studies and large expenditures for preliminary work in most cases before the construction of the treatment works can be undertaken. Many of these cities are now engaged in this preliminary work.

This supervision should include inspection of the works, analyses of sewage and effluents, and examination of records of operation. With these data the state officials can advise those in charge of the works how to operate them to obtain the optimum results.

Inspections and sampling by the state should be done not at regular intervals but at such times when critical conditions exist in order to be familiar with the results obtained at times of maximum load when defects are most noticeable. This is not meant to base judgment of regular operation by observations under worst conditions but to obtain data for helpful suggestions to those in charge. Regular conditions are obtained from the reports of operation to be discussed later.

As illustrating the importance of laboratory analysis of samples, an official of one of the most experienced State Boards of Health in this matter wrote:

". . . it is impossible to determine the character of sewage through visits and without analysis of samples. A case occurred in this state where an engineer of large experience examined an open sewer in that way and reported that it was sewage. As a matter of fact, analyses of numerous samples disclosed that it averaged only about 10 per cent. of the strength of ordinary sewage and rarely exceeded 15 per cent. of that strength. On the other hand, I have seen sewages four or five times as strong as the average on account of manufacturing wastes, the condition of which was not disclosed by the appearance of the liquid."

For the purpose of recording results of inspections, regular forms should be provided to minimize the clerical work of the inspector and systematize the data as filed.

REPORTS OF OPERATION.

Your committee has carefully considered the preparation of a standard form of report and has come to the conclusion that it is impracticable to do so.

Conditions in the various states and even in different parts of the same state differ between such wide limits that data absolutely essential in some places are useless in others. However, some basic principles may be given.

The data furnished should only include essential matters to a propèr understanding of conditions and results accomplished.

The engineer of one of the State Boards of Health wrote us:

"The kind of information collected . . . is that which is most important for us to know about that particular (plant). In many cases there is additional information, sometimes a large amount of it, that we would like to obtain, but if we attempt to obtain it we overburden the operator and are apt to get nothing at all. . . . We confine ourselves to the essential facts and collect these facts ourselves if we cannot get them from the attendant in charge."

Oftentimes matters of considerable moment to the operator for purposes of official record are unessential to the state and hence should be eliminated. The data to be recorded should be determined jointly by the official of the state and the operator. In this way the state will obtain uniformity of records by obtaining the same essentials for each process used.

For example, it may not be essential for the operator to know the time of retention of sewage in a tank. But if the record contains a statement of the rate of flow, the state officials from the plans filed may obtain the information when needed.

It is essential, if comparison is to be made between results obtained from different laboratories where samples are plated, that the report of number of bacteria should be accompanied by a statement of the kind of media, temperature and time of incubation that was used.

The records should be made on sheets either $8\frac{1}{2}''$ x $11''$ or of such dimensions as to fold to that size to facilitate filing in standard letter files. They should preferably be made in pads so that the operator by placing carbon paper beneath the upper sheet can obtain a copy for himself.

Under present conditions it is advisable that generally these records should be sent to the State Board or Department of Health at monthly intervals, although it is recognized that in some cases reports at weekly intervals should be required, and in special cases records may be required at irregular times to indicate certain conditions essential to proper protection to the public.

Generally, reports should be submitted by all sewage treatment works. In cases of small domestic or institutional plants it may be felt that there is practically nothing to report. But in such cases if the owner is required to send a report to the state setting forth the condition of the plant it is an incentive to at least examine its operation occasionally, which otherwise would be overlooked.

It is important, if reports are to be of any value save as records, that they should be sent to the state officers as soon as practical after the close of the period covered by the report.

Responsibility of State Boards.

In making the above recommendations, your committee recognizes that it places added work upon engineering staffs which at present, in most cases, are already overburdened and insufficiently provided with funds.

To carry out the recommended

procedure also places responsibility upon the state officials and calls for expert knowledge concerning all the details of sewage works operation.

It is therefore necessary that the funds be provided by the various legislatures and that trained men be placed in charge if the procedure recommended is to be successfully carried out.

Respectfully submitted,

F. E. Daniels,
C. A. Emerson, Jr.,
C. B. Hoover,
Richard Messer,
W. L. Stevenson, *Chairman.*

APPENDIX.

The sewage treatment plants in Ohio have been classified and subdivided by Mr. W. H. Dittoe, Chief Engineer of the Ohio State Board of Health as follows:

"Class 1. Municipal sewage treatment plants. These include plants of various types installed to serve the entire area of a municipality or the major portion thereof;

"Class 2. Sewage treatment plants for realty allotments and districts of a municipality. These include plants principally installed as private enterprises in connection with the development of real estate either within or without an incorporated municipality. They also include plants which serve small sections of a municipality;

"Class 3. Sewage treatment plants for industrial establishments. These include plants installed for the treatment of sewage from industrial plants and are not to be confused with plants installed for the treatment of industrial wastes;

"Class 4. Sewage treatment plants for public institutions. Public institutions cover state, municipal and county institutions;

"Class 5. Sewage treatment plants for private institutions, country clubs, etc.;

"Class 6. Sewage treatment plants for summer resorts, chautauqua grounds and summer camps;

"Class 7. Sewage treatment plants for school buildings.

"The following table gives the number of plants in each class at present existing and under construction.

EXISTING SEWAGE TREATMENT PLANTS IN OHIO, AUGUST, 1916.

Population designed for.	Less than 500.	500 to 10,000.	Over 10,000.	Total.
Class				
1	1	49	6	56
2	10	1	–	11
3	6	1	–	7
4	31	9	–	40
5	13	1	–	14
6	1	3	–	4
7	30*	–	–	30
Totals	92	64	6	162

* Approximate.

"The data regarding the first 6 classes are as accurate as it is possible to obtain them. The approximate number of installations for treatment of sewage from school buildings is given. During the years 1912 to 1916 (August 1) we have approved plans for sewage treatment devices for 60 school buildings and we estimate that about 30 of the installations have been made. They include treatment devices ranging from tanks to complete plants involving intermittent sand filters.

"In addition to the existing plants given in the table, 6 plants under Class 1 are being constructed. Three of these are designed for populations between 500 and 10,000 and 3 for populations over 10,000. The Columbus plant is the only one at present having laboratory control. However, provision for laboratory control has been made for the new plants at Akron, Canton, Alliance and Sandusky."

AMMONIA FROM THE ACTION OF CAUSTIC SODA ON ORGANIC MATTER A SOURCE OF ERROR IN THE DETERMINATION OF NITRATES IN SEWAGE AND SEWAGE EFFLUENTS BY THE REDUCTION METHOD.

Stephen DeM. Gage and Henry H. Anderson,
Laboratories of the Rhode Island State Board of Health.

(Abstract.)

IN the determination of nitrates in sewage etc., by reduction to ammonia with caustic and aluminum foil, ammonia is formed by reacton of the caustic on the more easily decomposed organic matter which is read with that derived from the reduction of the nitrates and nitrites.

When the caustic is added before boiling off the free ammonia, as recommended in the Standard (A. P. H. A.) methods, the ammonia formed during the boiling process is driven off, but as the reaction continues during the reduction period, the results will be in error unless a correction is made for this organic ammonia.

With the standard procedure the errors from this organic ammonia are seldom less than 0.1 part nitrogen per million even when the organic matters are low and well oxidized as in effluents from well operated sand and sprinkling filters, while with raw sewages this error may amount to 1.0 part or more.

In many laboratories the caustic is not added until after boiling of the free ammonia. With this procedure the organic ammonia from the action of the caustic is seldom less than 0.5 part N. per million and with some sewages may average 3.0 to 5.0 parts per million.

For accurate work the ammonia derived from the action of the caustic on the organic matter should be determined for each sample and deducted from the total ammonia obtained from the reduction process.

When both sets of results have been corrected for organic ammonia from the caustic treatment there is a very close agreement between the results obtained by the standard procedure and those obtained by adding caustic after boiling off the free ammonia.

SOME OBSERVATIONS ON THE BACTERIAL EXAMINATION OF MILK.*

Dr. Francis H. Slack,
Director, Sias Laboratories, 227 Summit Avenue, Brookline, Mass.

THE milk industry has been revolutionized during the past ten years largely on account of the introduction of bacterial examinations and the consequent emphasis placed upon cleanliness and care during the production and transporation of this important food.

The value of uniform methods of procedure in making these tests was early recognized by the Laboratory Section of the American Public Health Association and the standards adopted by the section have been widely accepted and followed.

It has been the effort of the Committee on Standard Methods of Bacterial Milk Analysis to recommend, as far as possible, those standards which approximated in their results, the actual number of bacteria present in the sample, and indeed this is the only attitude to take, since methods which result in reports of excess or greatly diminished numbers of bacteria compared with those actually present are open to criticism either of favoring or discriminating against the producer.

It is of the utmost importance then that the methods by which the bacterial count are made should be beyond question or suspicion. It has been truly observed of most of the manipulations employed that any error present favors the producer and that on account of various difficulties in obtaining growth or visible colonies of all the bacteria present the reported count is always lower than the actual number of bacteria present.

It should be our effort in further development of the standards to reduce this discrepancy and no standard commonly accepted and used should be replaced by a new one until repeated careful tests by competent workers have proved the superiority of the new method to the one discarded.

The adoption, for instance, of media made with meat extract instead of with fresh beef juice is, in the writer's opinion, a retrogressive step, and one that unnecessarily favors the producer by allowing him to exercise less care and by permitting much milk upon the markets which would be held up on account of high bacterial content if a medium were used more favorable to the growth of milk bacteria.

The same is true of the present standard meat extract agar with 1½ per cent. agar and plus 1 reaction, Fuller's scale, as compared with the former standard beef juice agar with 1 per cent. agar and plus 1.5 Fuller's scale. The original medium was adopted only after the most careful research by Prof. C. E. Marshall and his assistants who made thousands of tests comparing various strengths of agar and different degrees of acidity of the media.

Partly with these thoughts in mind

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*In order to avoid excessive cost of publication, numerous tables accompanying this paper have been omitted. Any person interested in special details can obtain further information from the author.—Editor.

and also to gather data on other aspects of milk examinations yet in the debatable stage, the following tests were undertaken. The writer regrets that the call of two members of his small staff to the Mexican border coming at the regular vacation time when others had to be released cut this work short before it had attained that degree of completion he had planned, and only offers it in its present state as an evidence of his sincere interest and with the hope of pursuing the investigations outlined more fully in the future.

The first tests were begun by four members of the Boston Health Department laboratory staff with the following objects:

1. To compare counts on plates grown for twenty-four hours and forty-eight hours at 37 degrees C.
2. To compare counts obtained from the beef juice medium 1 per cent. agar reaction plus 1.5 as recommended originally by the Milk Committee with counts from the meat extract media 1.5 per cent. reaction plus 1 since recommended.
3. To compare microscopic estimates made by the smeared sediment method with the plate counts.
4. To compare the reports of several independent workers upon the same samples of milk.

Professor James O. Jordan kindly consented to arrange for the collection of samples and the division of each into four parts identified by marks known only to him. The divided samples, in groups of five, were then given to four of the laboratory bacteriologists for the work outlined. The tests were made and the returns handed to Professor Jordan who collated them as they appear in the tables. Each worker performed his tests independently and plated from such dilutions as seemed best to him judged by his microscopic estimate, it being understood that each sample was to be plated with both the old and the new agar, two dilutions to be plated out for each sample with each of the media and all plates to be made in duplicate. With four workers this called for thirty-two plates to each sample, or a total of 640 plates for the series.

A careful comparison of the results obtained showed that the 48 hour count was 2.59 times the 24 hour count with the beef juice media and 3.27 times the 24 hour count with the extract media.

The beef juice media averaged 1.80 more colonies with the 24 hour count and 1.62 more with the 48 hour count than the extract media.

A marked feature in comparison of the two media is the minute size of the colonies on the new or extract media as compared with the old media it replaced. Even with the 48 hour count many of these colonies are barely within the range of visibility while on the old media the colonies as a general thing show very plainly.

In comparing the microscopic estimate with reported counts it must be remembered that this is but an estimate and claims are not made for great accuracy. No attempt is made to actually count the organisms under the microscope but the specimen is quickly "sized up." In routine work in the Boston laboratory the estimation is made only to judge the bacterial content with relation to our standard of 500,000 to the cubic centimeter. When the estimate is below 500,000 the sample is passed without further work and as a large percentage of the samples are well within this limit the use of this preliminary examination saves much labor and material. If the estimate is around or above 500,000, plates are made to find, as nearly as possible, the actual count.

COMPARISON OF REPORTS OF FOUR WORKERS ON TWENTY MILK SAMPLES.

48 hour count, old standard media.

No.					
1.	All agree on counts below 500,000.	Reports vary from	88,000	to	310,000
2.*	Three " " " " "	" " "	120,000	"	240,000
3.	All " " " " "	" " "	196,000	"	284,000
4.	All " " " above "	" " "	32,000,000	"	62,700,000
5.	" " " " below "	" " "	8,000	"	16,000
6.	" " " " " "	" " "	20,600	"	80,500
7.	" " " " " "	" " "	101,000	"	117,500
8.	Three below and one above 500,000	" " "	171,800	"	530,000
9.	All agree on counts below 500,000	" " "	140,000	"	245,000
10.	" " " " " "	" " "	32,500	"	60,000
11.	" " " " " "	" " "	250,000	"	450,000
12.	" " " " above "	" " "	3,640,000	"	6,900,000
13.	" " " " " "	" " "	3,750,000	"	54,000,000
14.	Two below one above 500,000 one spreader	" " "	303,000	"	797,500
15.	Three above one below 500,000	" " "	225,000	"	1,460,000
16.	All agree on counts below 500,000	" " "	80,000	"	230,000
17.	Three below, one above 500,000	" " "	315,000	"	580,000
18.	" above, " below "	" " "	185,000	"	1,280,000
19.	All agree on counts below 500,000	" " "	1,000	"	3,400
20.	" " " " above "	" " "	6,500,000	"	69,500,000

* The report of the fourth worker on this sample 48,500,000 was evidently due to contamination of sample.

When the estimate is above 1,000,000 accuracy as to the exact number of millions present is not attempted unless the worker so desires.

In these particular tests, 73 microscopic estimates were made where a count was reported after 48 hours' growth on the best media, of which 65 agree with the report of the worker in relation to the 500,000 standard. Of the remaining eight, four were given an estimate above the count and would have been plated in routine work, the other four, or a little over 5 per cent. received too low an estimate and would have been passed.

There were fourteen microscopic estimates of 500,000. (In routine work these of course would be plated.) The reported counts on these fourteen samples showed eight with a count below that limit ranging from 114,500 to 380,000 and six above it varying from 530,000 to 4,200,000.

Reporting on twenty samples the four workers agree on fourteen with relation to the standard of 500,000. Of the remainder, three agree on five and the sixth is two to one and one spreader.

Assuming that count to be correct on which a majority of the workers agree it is shown that fourteen of these twenty samples had counts below 500,000 and six had counts above that figure.

Of the fourteen samples, each plated by four workers, we have fifty-six reports, fifty-one of which are agreed on counts below 500,000. Of the remaining five, one count, on sample two, is so far different from the others on the same specimen that it is evidently the result of an error. Three were near the 500,000 line being 530,000, 580,000 and 797,500 respectively, and one was a spreader.

On the six samples with more than 500,000 there are 24 reports 22 of which are agreed, the other two being 185,000 and 225,000 respectively.

These tests in the opinion of the writer demonstrated undoubted superiority of the 48 hour count over the 24 hour count and of the meat juice medium over the extract medium.

It was decided to run another series of tests for further comparison of results of different workers using the meat juice media alone with the understanding that an attempt would be made in each instance to secure plates with counts between 20 and 200 colonies and that wherever possible counts should be reckoned from these plates only.

COMPARISON OF REPORTS OF DIFFERENT WORKERS ON THIRTY SAMPLES OF SECOND SERIES.

Sample.	Workers.	Agree on counts below 500,000.	Agree on counts above 500,000.	Disagree on count.	Remarks.
1.	5	..	5	..	....
2.	5	..	5	..	....
3.	5	..	5	..	....
4.	5	..	5	..	....
5.	5	..	5	..	....
6.	5	..	5	..	....
7.	5	5	..	..	....
8.	5	5	..	..	....
9.	5	2	3	..	....
10.	5	5	..	..	....
11.	4	4	..	..	....
12.	4	..	4	..	....
13.	4	..	4	..	....
14.	4	..	3	1	....
15.	4	4	..	..	....
16.	3	3	..	..	....
17.	3	..	2	1	....
18.	3	3	..	..	....
19.	3	..	2	1	....
20.	3	2	..	..	1 spreader
21.	3	..	2	1	....
22.	3	..	3	..	....
23.	3	..	2	..	1 spreader
24.	3	2	..	1	....
25.	3	..	3	..	....
26.	3	..	3	..	....
27.	3	..	..	..	....
28.	3	3	3	..	....
29.	3	..	3	..	....
30.	3	..	3	..	....

SECOND SERIES OF TESTS.

This series consisted of thirty samples collected and divided as before. Five samples were tested each week by as many men, varying from three to five, as could be spared for the work. Checks were also made on the counts and, after the first five samples, on the microscopic estimates by having each worker's plates counted again by another and by having each worker's sediment smears examined again by another worker for comparison on the microscopic estimate. All tests were made with the old standard media and reported on 48 hour counts.

In this series of tests there were 115 microscopic estimates made by the smeared sediment method, of which 103 agree with the reported count as being above or below the 500,000 standard. In ten instances the estimates were below 500,000 and the counts above that figure. (These counts were 1,170,000: 600,000: 930,000: 670,000: 615,000: 560,000: 700,000: 580,000: 740,000 and 560,000.)

There were two spreaders.

Of the 90 specimens on which duplicate estimates were made there were but three which made a change in relation to the 500,000 limit. Two of these were in the nature of corrections of errors noted above, making estimates above 500,000 for the samples which gave counts of 1,170,000 and 740,000.

There were in the original 115 estimates, eight estimates of 500,000, of which the counts showed seven above and one below that figure. The 90 duplicate estimates also gave eight of 500,000 of which the counts showed seven above and one below that figure.

As shown in the tabulation on page 693 all the workers agree on results, in relation to the 500,000 limit, on 22 out of the 30 samples examined.

There were two other samples where all who made reports agreed but count of one worker was lost by spreaders (leaving but 113 counts reported). Of the remaining six samples but one worker disagreed on five as shown below:

Sample 14, all agreed on count above 500,000 excepting D who reported 280,000
Sample 17, all agreed on count above 500,000 excepting B who reported 475,000
Sample 19, all agreed on count above 500,000 excepting A who reported 417,000
Sample 21, all agreed on count above 500,000 excepting D who reported 260,000
Sample 24, all agreed on count below 500,000 excepting C who reported 560,000

On the other sample No. 9, three reported counts above 500,000 and two below that figure. The average count was 564,000.

Assuming the count agreed upon by the majority to be the correct count for the sample there were two errors on sample 9 and one each on the other five, making a total of 7 out of 113 determinations or about 6 per cent. These errors were slight, the counts in question varying from 260,000 to 560,000.

A study of duplicate counts made on these same plates by other workers shows no change of the relation to the 500,000 limit in 104 out of 115 determinations.

Of the eleven remaining determinations six were rejected by the second worker as spreaders and two were lost through an accident, the plates being broken; in three only was the count changed.

Sample 19 was reported by B at 560,000 while A reported from a count of the same plates 485,000, while in

A COMPARISON OF ACTUAL REPORTS ON THIRTY SAMPLES.

(Without consideration of the 500,000 limit.)

Sample No.	Average count.	A.	B.	C.	D.	E.
1.	4,498,000	4,000,000	4,800,000	8,000,000	2,690,000	3,000,000
2.	22,000,000	17,000,000	53,000,000	20,000,000	8,500,000	11,500,000
3.	17,440.000	12,500,000	22,000,000	30,000,000	12,700,000	10,000,000
4.	64,700,000	79,000,000	32,000,000	60,000,000	52,500,000	50,000,000
5.	18,120,000	35,000,000	22,000,000	10,000,000	14,600,000	9,000,000
6.	2,814,000	2,100.000	3,800,000	6,000,000	1,000,000	1,170,000
7.	39,540	4,400	50,000	46,000	42,000	15,700
8.	21,600	22,500	15,000	29,999	26,500	15,000
9.	564.000	600.000	930,000	270,000	670,000	350,000
10.	2,130	1,900	2,400	2,500	1,900	1,950
11.	159.000	142,000		84,000	190,000	220,000
12.	2,302,500	2,420,000		2,500.000	2,600,000	1,690,000
13.	2,000.000	2,550,000		1,850,000	2,100,000	1,500,000
14.	1,367,500	2,350,000		1,390,000	280,000	1,450,000
15.	254,750	375,000		144,000	200,000	300,000
16.	75,033	72,100	84,000		69,000	
17.	813,333	615,000	475,000		1,350,000	
18.	69.333	66.000	60,000		82,000	
19.	559.000	417,000	560,000		700,000	
20.	337.500	sp	425,000		250,000	
21.	501,666	865,000		260,000	580,000	
22.	9,666,666	6,500,000		12,000,000	8,700,000	
23.	737,500	735,000		sp	740,000	
24.	247,500	230,000		560,000	200,000	
25.	52,000,000	71,000,000		43,000,000	42,000,000	
26.	2,800,000		2,400,000		3,500,000	2,500,000
27.	150,333		180,000		167,000	86,000
28.	11,266,666		12,300,000		15,000,000	6,500,000
29.	26,066,666		38,000,000		19,000,000	21,200,000
30.	10,866,666		10,500,000		16,900,000	5,200,000

Taken from the Preceding Table to Show the Percentage Relation of Counts of Individual Workers to the Average Count.

Sample No.	A.	B.	C.	D.	E.
1.	.88	1.06	1.77	.59	.66
2.	.77	2.40	.90	.38	.52
3.	.71	1.26	1.71	.72	.57
4.	1.22	1.26	.92	.81	.77
5.	1.93	1.21	.55	.80	.49
6.	.74	1.35	2.13	.35	.41
7.	1.11	1.26	1.16	1.06	.39
8.	1.04	.69	1.34	1.22	.69
9.	1.06	1.64	.47	1.18	.62
10.	.88	1.12	1.17	.88	.91
11.	.89		1.52	1.19	1.38
12.	1.05		1.08	1.12	.72
13.	1.27		.92	1.05	.75
14.	1.71		1.01	.20	1.06
15.	1.47		.57	.78	1.17
16.	.96	1.11		.91	
17.	.75	.58		1.65	
18.	.95	.68		1.35	
19.	.74	1.00		1.43	
20.		1.25		.74	
21.	1.72		.51	1.15	
22.	.67		1.24	.87	
23.	.99			1.00	
24.	.92		2.26	.80	
25.	1.36		.82	.80	

26.		.85		1.25	.89
27.		1.19		1.11	.57
28.		1.09		1.33	.57
29. .		1.45		.72	.81
30.		.96		1.54	.47
Totals	25.99	23.59	21.05	28.98	14.42

DIVISION OF TOTALS BY NUMBER OF TESTS TO SHOW AVERAGE OF INDIVIDUAL WORKERS.

A. 24)25.99(1.07
B. 20)23.59(1.17
C. 19)21.05(1.10
D. 30)28.98(.96
E. 20)14.42(.72

DEDUCTIONS FROM PRECEDING TABLES SHOWING RELATION OF COUNT OF INDIVIDUAL WORKERS TO AVERAGE COUNT.

Relation to average count.	A.	B.	C.	D.	E.	Totals.	
Within 10%	7	4	5	4	2	22	
Between 10 and 20%	4	5	3	11	3	26	
Between 20 and 30%	7	5	1	6	3	22	
Between 30 and 40%	2	2	1	2	4	11	
Between 40 and 50%	1	2	4	2	4	13	94
Between 50 and 100%	3	1	3	5	4	16	
Over 100%	1	2				3	19
Totals	25	21	17	30	20	113	113

sample 21 A and E report from the same plates 865,000 and 315,000 and D and B report 580,000 and 490,000. Each of these reports was based upon findings from four plate counts.

Ninety-four reports out of 113 or 83 per cent. agreed within 50 per cent. of the average count for the sample. In only three, a little over 2 per cent. was the variation more than 100 per cent.

A comparison of reports from duplicate counts made in the same manner as the preceding table showing relation of individual count to average count is also most interesting and shows practically the same results.

There were 115 results checked up by a second worker recounting the other's plates and passing in an independent report, Of these there were six spreaders and two counts lost, leaving 107 on which reports were made. The relation of the duplicate report to the original is shown below. Each report is based upon four plate counts.

Within 10%	38	
Between 10 and 20%	34	
Between 20 and 30%	15	
Between 30 and 40%	7	
Between 40 and 50%	11	98
Between 50 and 100%	6	
Over 100%	3	9
	107	107

Ninety-eight out of 107 reports or 91 per cent. are within 50 per cent. of the original. Only three show over 100 per cent. difference and the count on these three samples was in the millions per cc.

CONCLUSIONS.

Incubation of milk plates for 48 hours, rather than for 24 hours, is advisable, since, on an average, the count is doubled or trebled.

The use of meat extract media for milk counts should be abandoned, since it gives lower counts, and also because the colonies are much smaller than with media made from fresh beef juice. The old standard medium adopted after careful experiments should be used until replaced by one giving higher average counts.

A preliminary microscopic estimate of the number of bacteria in a milk sample by the smeared sediment method is advisable,

1. To rule out specimens of low bacterial content on which no further work need be done.
2. To judge the proper dilution for specimens which must be plated.

Such an estimate as compared with plate counts presents an error of less than 10 per cent. in judging whether samples are above or below a certain standard, and the counts where this error occurs are very close to the figure determined upon for a criterion.

The reports of various workers upon the bacterial content of milk samples, as to whether they contain more or less bacteria than allowed by regulation, agree very closely, the error being about 6 per cent. Here also the error is almost negligible the counts reported erroneously approximating very closely the figure which the regulation established as a limit.

The actual reports of various workers upon these samples indicate that the ordinary bacterial count of a milk sample is reasonably accurate.

The writer wishes to acknowledge his indebtedness to Prof. James O. Jordan, Milk Inspector of Boston, and to Dr. Philip Castleman, Dr. Karl Bailey, Dr. E. J. O'Donoghue and Mr. Wm. Campbell of the Boston Health Department laboratory force for their coöperation in this series of tests.

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RED CROSS CREATES SANITARY SERVICE BUREAU.

The Red Cross authorizes the following:

Following its policy of caring for the health not only of the soldiers and sailors of the United States, but as well that of the civil population, the American Red Cross has established a bureau of sanitary service, which will supplement and assist Federal, State, and local health authorities in meeting sanitary emergencies created by the war. The work of the bureau will center in the civilian areas surrounding Army cantonments.

While sanitary control of National Army cantonments, National Guard camps, and naval bases will be exercised by the military authorities the districts immediately adjoining these camps will be under no such jurisdiction. Yet the assembling of large bodies of troops will create new sanitary conditions. These must be met to safeguard the health of civilians as well as of soldiers.

The problem of milk supply, for example, will be greatly enlarged. The supply itself must be doubled and sometimes trebled, and this means increased forces for inspection. In the Southern States, where malaria is a danger, the Red Cross has already undertaken efforts looking toward the extermination of mosquitoes. They must be eliminated not only in the camps proper, but in the surrounding country. Cleaning up pools and other breeding places within a mile radius of camps will mean covering from 15 to 60 square miles.

W. H. Frost, surgeon of the Public Health Service, has been assigned by the Surgeon General, at the request of the Red Cross war council, as director of the bureau of sanitary service. Dr. Frost is one of the leaders of his profession and has had wide experience extending over 13 years in the Public Health Service.

—*Official Bulletin*, Aug. 7, 1917.

A SYNOPTIC REPORT ON A COMPARATIVE SANITARY SURVEY OF TWO MASSACHUSETTS CITIES.

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Sanitary surveys of towns and cities have often been made, and with excellent results, but as far as I am aware no strictly comparative sanitary study of two or more towns has hitherto been attempted. My attention was drawn to this fact by Prof. W. T. Sedgwick of the Massachusetts Institute of Technology, with the suggestion that I should undertake such an investigation as a thesis for the Master's degree in the Department of Biology and Public Health.

The sanitary survey is a relatively recent undertaking. Perhaps the best known surveys are those made by Franz Schneider, Jr., of the Russell Sage Foundation in New York City, and those by the officers of the U. S. Public Health Service. These investigators have visited cities of different sizes, in different climates, of different industrial pursuits, or composed of different races, and have studied carefully the factors affecting the health of a single community. Such a survey bears somewhat the same relationship to a body politic as a physical examination bears to the body of an individual.

Some attempts have also been made to compare the health activities of municipal and state departments of health by the questionnaire method, but such information gives comparatively little knowledge of the conditions of the public health in the various communities. Vital statistics have also been employed to advantage as an index of health conditions in various communities and have been used as a basis of comparison. But these have their full significance only when linked to a knowledge of the biological activities and environmental conditions of environment found in the communities under consideration.

It was, therefore, determined to make a detailed comparative study of two cities in which a careful examination of the vital statistics should be correlated with complete sanitary surveys. In order to make a promising choice of cities for comparison, those in the state of Massachusetts in 1915 having populations of 10,000 and over were subjected to a kind of reconnaissance. In the first place the death-rates for all such cities for a number of years were tabulated. It was important to choose two cities not too distant from each other, so that the people would be under the same climatic conditions. It was also desirable to avoid cities that might be suburbs of Boston, because the residents of suburban communities spend much time in the metropolis and hence are subject to the numerous influences of that city. As a rule suburban communities simply serve as residential places for those who work in the city. Hence these do not afford the same problems in public health that the city does.

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* The expense of publishing this article is borne by the Sanitary Research Laboratory of the Massachusetts Institute of Technology.—Editor.

The two cities to be compared should if possible have about the same population and age distribution, and about the same race distribution. At the same time, they ought to differ in death-rates or other respects in order to afford a real problem which the investigator should attempt to solve. Eventually a number of cities were coupled and the predominating industries for each obtained from the 1910 Census. Finally, after careful consideration, Quincy and Taunton were chosen for the comparative study in view. Here were two cities of similar population and age distribution, yet differing in predominating industries and in race distribution. Taunton had high death-rates—partly explainable by the Taunton State Hospital for the Insane—whereas Quincy had low death-rates. Taunton had high infant mortality-rates and Quincy comparatively low rates. Hence there appeared to be problems enough to solve, and upon these the entire investigation aimed to throw light. The data compiled and considered in addition to the vital statistics are given below, with an indication in each case of the results of the work.

The present communication is synoptic only. The complete thesis is on file in the archives of the Department of Biology and Public Health of the Massachusetts Institute of Technology, where it may be consulted.

METHOD OF ATTACK.

After tubulating the populations and death-rates since 1900, for every city in Massachusetts whose population in 1915 was at least 10,000, the cities having similar populations were grouped together. Knowledge of the predominating industries for these cities was obtained from the 1910 Census. After careful consideration the list of possible selections was limited to six. Further study of the census statistics, location, size, predominating industries, etc., showed that Taunton and Quincy would serve best for comparison.

The next step was to make a complete and thorough study of the vital statistics since 1890. To do this, it was necessary to consult original death certificates, and the records of the Taunton State Hospital for the Insane, besides the Massachusetts State Registration Reports. The most recent annual reports of both cities were carefully studied before field work was begun Other relevant literature was also consulted.

Having completed the preliminary office studies, I began a series of frequent visits to both cities, studying carefully local conditions and collecting fundamental data. About one month was thus spent in each city. The work consisted essentially of inspections, investigations and interviews with officials, farmers, factory superintendents and other people in some way associated with the problem under consideration. The data so collected were immediately put in writing, and comparisons made with previous observations. Shortcomings were thus recognized early and rectified. Eventually all data were correlated and compared and the results tabulated.

ACKNOWLEDGMENTS.

I desire to express particular thanks

to Prof. W. T. Sedgwick for his numerous suggestions and his aid; to Prof. S. M. Gunn for his interest and criticisms; to Prof. C. F. Park for making possible the industrial hygiene studies in Taunton; to Dr. M. E. Champion for his aid in Quincy; to the Boards of Health, the principals of the schools, the Associated Charities, the various factory superintendents, and all others in Quincy and Taunton who in any way assisted in making this work possible.

The above comparative rating shows that the health work in Quincy and Taunton is about on the same plane. Yet there exist several striking differences in the vital statistics of the two cities. Taunton has a high infant mortality-rate, a high crude death-rate, and high specific death-rates for certain diseases. For the same items, Quincy's record is much better. All this is true in spite of the fact that Quincy's birth-rate has always been either equal to or greater than that found in Taunton; and in spite of the fact that the age distribution of the people in Quincy is approximately similar to that found in Taunton, ac-

COMPARATIVE RATINGS OF HEALTH WORK IN QUINCY AND TAUNTON, MASS. USING DR. C. V. CHAPIN'S STANDARD SCORE CARD AS THE BASIS FOR COMPARISON.

			Standard.	*Quincy.*	*Taunton.*
Communicable Diseases	Medical Inspection				
	Nursing		100	0	0
	Hospitalization		50	0	0
	Antitoxin Administration		50	20	20
	Immunization				
	Venereal Diseases		20	0	0
	Ophthalmia				
	Tuberculosis	Nurses	60	20	20
		Dispensaries	40	20	20
		Hospitalization	40	5	5
Child Hygiene	School Inspection		80	50	35
		Nurses	80	0	0
		Supervision of Midwives	10	0	0
	Infant Mortality	Boarding Houses	5	5	0
		Milk Stations	5	0	0
		Consultations	20	0	0
		Prenatal Clinics	10	0	0
Sanitation	Privy Sanitation		110	90	30
	Housing		20	15	10
	Plumbing		10	8	8
	Nuisances		10	7	7
	Fly and Mosquito Control		10	0	0
	Garbage Removal		0	0	0
	Clean-up Campaigns		0	0	0
Food	Adulteration		0	0	0
	Sanitation		10	0	0
Milk	Adulteration		0	0	0
	Sanitation		20	5	0
Care of Sick Poor			50	15	10
Laboratory			50	0	0
Education			80	10	10
Vital Statistics			60	15	15
Totals			1,000	285	200

cording to the 1910 Census figures. We must, therefore, look elsewhere for explanations.

And certain striking differences are at once observed. The race distribution of the people in Quincy differs from that in Taunton. Quincy's population is composed of Finns, Swedes, Scotch, Irish, Italians and Russians, besides the native-born American stock. Taunton's population is composed of Portuguese, Polish, French Canadian and Irish, exclusive of Americans. Yet there is no reason to believe that the differences in races, *per se*, have any marked effect on the infant mortality-rates or the specific death-rates.

WOMEN IN THE INDUSTRIES.

Another very evident difference lies in the nature of the industries. Taunton has cotton mills and stove works, machine shops, oil cloth factories, silver and copper factories, wool stock works and dye works. Quincy has two main industries—granite works and quarries, and large shipbuilding yards. At least one other industry in Quincy is large and deserves to be mentioned. It is the manufacture of rivets and studs. But all the industries in Quincy are of such a nature that male labor is almost entirely employed. Women could not very readily find occupation in quarries or stone works or ship yards. In Taunton, the conditions are different. The large number of cotton mills furnish occupation for several thousand women of all ages, regardless of marital condition and the employment of women in industry has a very marked effect on the infant mortality-rate in any community. With this evil generally go many more, as boarding infants out, poor housing conditions, poverty, ignorance, lack of breast feeding, lack of care and attention to the infant and other factors of less importance. In Quincy, on the other hand, the women are compelled to stay at home, to give all their time and attention to the children and to their homes. It is this difference which probably gives the key to the extreme variation in infant mortality-rates in the two cities.

WAGES AND HOURS OF EMPLOYMENT.

In the comparison another difference is made evident. Quincy workers are paid more and work fewer hours during the day than do the workers in Taunton. This enables the Quincy workers to tide over dull seasons more comfortably and with less privation. Just how much effect this condition has on the health of the people cannot be definitely determined as it is so difficult to actually measure the value of this factor without complicating it with others. But that it has some effect will not be denied.

INDUSTRIAL HYGIENE AND SANITATION.

Industrial conditions are worse in Taunton from the health standpoint. The undesirable and detrimental conditions of dusts, fumes, poor light, poor ventilation, temperature, humidity and unguarded moving parts of machinery are very much more prevalent there. Although the Quincy granite cutters work almost always in the presence of large amounts of granite dust, they are very frequently in the open air, and are never subjected to high temperatures and low or high humidities in closed rooms. It appears that the specific death-rates for pneumonia and tuberculosis are very much higher in Taunton, and this is true in spite of the fact that the Quincy granite workers are always engaged in atmospheres containing stone dust. Apparently the conditions of air supply, temperature and humidity constitute very important factors which must be considered when the dangerous effects of dusts on the health of workers are weighed.

WATER SUPPLY.

The water supply in both cities is of excellent quality and is well protected against serious pollution or infection.

SEWERAGE AND SEWAGE DISPOSAL.

In this field Quincy is also further advanced than Taunton. Quincy is almost entirely sewered and the toilets are almost always connected with the sewers. The sewage is also discharged at a point where at present no nuisance or danger to health is created. Taunton, however, still has to complete a goodly portion of its sewerage system and there exist a great many privies which as a rule are very poorly kept. The open privies constitute an important health problem which should be remedied by the installation of water closets, and by the better protection and care of those privies where sewers are not yet laid. The present method of sewage disposal in Taunton also causes a serious nuisance which will have to be remedied by scientific treatment in the near future.

THE MILK SUPPLY.

Because of the fact that a large company sells and distributes pasteurized milk in Quincy, and because Quincy permits the sale of milk in the closed bottle only, Quincy's milk supply may be said to be better than that of Taunton. Except for these two differences, the milk supply in Quincy is on the same low level as that in Taunton.

HOUSING.

Viewing this problem broadly, it may be said that housing conditions are better in Quincy for the laboring classes. The main advantage that the Quincy houses have over those in Taunton lies in the fact that water closets are installed in almost every home in Quincy, whereas outside privies are very numerous in Taunton. As regards overcrowding and light and ventilation of the houses, nothing very definite is known and hence no comparison can be made. The statement at the head of this paragraph is based upon a general impression obtained in the surveys, from a limited investigation in Quincy and from a housing investigation made in Taunton.

SCHOOL HYGIENE AND SANITATION.

School sanitation is undoubtedly better in Quincy than in Taunton. School hygiene, on the other hand, is about on the same level in each city. Because of the employment of a very active school nurse by the City of Quincy, the school hygiene work in that city may be rated a little higher. Both cities devote a good deal of time and effort to determine and remedy eye, ear and dental defects. The school nurse in Quincy, moreover, is attacking the problem of pediculosis.

She also visits the homes of the children and is thus able to do a good deal of educational work.

THE ASSOCIATED CHARITIES.

The Associated Charities in Quincy are larger, better organized, and appear to co-operate more fully with the other welfare agencies, than is the case in Taunton.

DRUNKENNESS.

There are about twice as many arrests made in Taunton for drunkenness as are made in Quincy for the same cause. Hence drunkenness appears to be very much more prevalent in Taunton than in Quincy. The greater use of alcohol in Taunton, if it be a fact, undoubtedly affects the health of the people and the infant mortality-rate, but how large this effect is cannot be ascertained even approximately.

GARBAGE COLLECTION AND DISPOSAL.

Taunton operates a city piggery and disposes of its garbage in that fashion. Quincy sells its garbage to farmers for the feeding of pigs. Ashes and other refuse matters are generally dumped.

CLIMATE.

Quincy is situated about ten miles southeast of Boston, Taunton about twenty-five to thirty miles south. A study of the climatological data prepared by the Weather Bureau of the United States Department of Agriculture for the New England Section, shows that the counties which include Taunton and Quincy are subject to the same atmospheric conditions. The temperatures are approximately the same in both places. The precipitation is also about the same, and to all intents and purposes, it may be said that the climate of Quincy and Taunton is similar. Quincy, however, lies immediately on the coast, whereas Taunton is situated about thirty miles inland. Quincy is hilly and rocky, whereas Taunton is mostly flat country.

CONCLUSIONS.

A comparative study of these two cities has proved that health conditions in Quincy at present appear to be superior to those in Taunton. The factors that appear to be particularly significant in composing this difference may be tabulated as follows:

1. The greater amount of ignorance —lack of education and lack of knowledge of American customs and manner of living and lack of ability to speak English—among the population of Taunton.

2. The employment in Taunton of women in industries, and particularly married women.

3. Longer hours of work.

4. Poorer wages.

5. The greater number of industrial hazards in Taunton's industries.

6. The excessive use of alcohol.

7. The prevalence of many open and unprotected privies.

8. On the other hand, in the case of dipththeria the statistics seem to be more favorable in Taunton than in Quincy.

TABLE I.
VITAL STATISTICS TAUNTON, MASS.

Year.	Population.	Deaths.	Death-rate.	Total deaths minus non-resident insane deaths.	Corrected death-rate.
1891	25,781	445	17.3		
1892	26,114	595	22.8		
1893	26,447	575	21.7		
1894	26,780	574	21.4		
1895	27,115	497	18.3		
1896	27,899	587	21.0		
1897	28,683	607	21.1		
1898	29,467	576	19.5		
1899	30,251	671	22.2		
1900	31,036	667	21.3		
1901	31,022	565	18.2		
1902	31,008	568	18.3		
1903	30,994	653	21.1		
1904	30,980	637	20.6	517	17.2
1905	30,967	679	21.9		
1906	31,655	632	19.9	518	16.9
1907	32,313	731	22.6	638	20.3
1908	32,971	670	20.4	547	17.1
1909	33,629	720	21.4		
1910	34,259	810	23.6	695	20.9
1911	34,639	715	20.6	579	17.2
1912	35,020	751	21.4	601	17.6
1913	35,400	701	19.8	573	16.6
1914	35,781	801	22.4	612	17.6
1915	36,161	826	22.8	685	19.5

TABLE II.
TAUNTON, MASS.

Year.	Population.	Births.	Birth-rate.	Infant deaths.	Infant mortality per 1,000 births.
1890	25,448	671	26.3		
1891	25,781	704	27.4		
1892	26,114	714	27.3		
1893	26,447	776	29.4		
1894	26,780	663	24.8		
1895	27,115	718	26.4		
1896	27,899	765	27.4		
1897	28,683	696	23.9		
1898	29,467	772	26.2	109	141
1899	30,251	728	24.0	133	183
1900	31,036	788	25.4	161	204
1901	31,022	835	26.9	103	123
1902	31,008	756	24.4	93	123
1903	30,994	779	25.1	118	152
1904	30,980	811	26.2	126	155
1905	30,967	810	26.2	152	187
1906	31,655	885	27.9	142	160
1907	32,313	909	28.1	129	142
1908	32,971	961	29.2	146	152
1909	33,629	887	26.3	150	169
1910	34,259	956	27.9	203	212
1911	34,639	1020	29.4	160	157
1912	35,020	920	26.2	157	171
1913	35,400	931	26.2	138	148
1914	35,781	966	27.2	119	123
1915	36,161	978	27.1	152	155

TABLE III.
DEATHS FROM SPECIAL CAUSES IN TAUNTON, MASS.

Year.	Measles.	Scarlet fever.	Diphtheria.	Whooping-cough.	Typhoid fever.	Dysentery.	Diarrhea, all types.	Tuberculosis.	Pneumonia.	Bronchitis	Apoplexy.	Accident.	Alcoholism.
1890													
1891	—	1	9	—	3	8	29	62	35	13	18	15	—
1892	—	8	12	—	9	2	33	61	67	24	16	20	2
1893	2	10	8	3	7	4	43	43	62	13	17	18	8
1894	—	3	55	5	8	2	25	73	40	17	20	15	3
1895	—	1	29	—	2	—	22	52	35	13	20	18	1
1896	—	—	14	2	7	4	37	74	58	16	15	17	3
1897	1	5	9	1	8	1	29	63	62	18	22	13	1
1898	—	1	1	—	9	4	15	66	43	13	26	22	3
1899	—	2	8	6	8	5	28	61	80	12	26	27	1
1900	10	—	4	2	8	3	50	69	73	17	21	15	4
1901	—	4	6	1	9	3	39	61	46	12	34	14	1
1902	—	1	7	7	8	4	44	61	46	9	30	18	3
1903	1	5	10	4	6	4	44	52	69	20	35	15	3
1904	—	3	5	—	1	3	47	57	89	20	41	22	3
1905	1	3	10	2	3	2	54	72	76	15	42	22	2
1906	3	—	2	10	10	5	42	64	71	21	37	17	3
1907	1	2	4	2	7	5	54	54	101	24	47	26	3
1908	2	8	1	4	7	1	59	71	68	19	48	12	3
1909	3	4	3	6	12	7	61	54	97	26	47	16	3
1910	6	1	8	1	7	3	122	47	111	17	48	34	5
1911	—	—	6	7	5	4	84	57	94	18	41	23	3
1912	4	2	4	6	1	1	72	63	111	13	37	29	4
1913	2	11	4	1	4	4	65	51	87	4	49	23	1
1914	—	7	2	6	1	1	55	73	119	14	40	23	5
1915	6	4	2	6	—	4	72	80	155	17	9	31	12

TABLE IV.
SPECIFIC DEATH-RATES FOR CERTAIN DISEASES IN TAUNTON, MASS.

Year.	Population.	Measles.	Scarlet fever.	Diphtheria.	Whooping-cough.	Typhoid fever.	Dysentery.	Diarrhea, all types.	Tuberculosis.	Pneumonia.	Bronchitis.	Apoplexy.	Accident.	Alcoholism.
1890	25,448	—												
1891	25,781	—	3.9	35.1	—	11.7	31.2	113.0	242.0	136.6	50.7	70.2	58.5	—
1892	26,114	—	30.6	45.9	—	35.4	7.6	125.3	231.2	253.6	91.3	61.2	76.0	7.6
1893	26,447	7.6	37.4	30.4	11.4	26.6	15.2	163.3	163.0	236.0	48.4	64.6	68.4	30.4
1894	26,780	—	11.2	205.2	18.6	29.8	7.5	93.0	271.8	150.0	64.8	74.4	55.8	11.2
1895	27,115	—	3.7	107.2	—	7.4	—	81.4	192.1	129.5	48.1	74.0	66.6	3.7
1896	27,899	—	—	50.2	7.1	25.1	14.2	131.2	262.1	206.0	56.8	53.2	60.3	10.7
1897	28,683	3.5	17.4	31.5	3.5	28.0	3.5	101.5	220.2	217.2	63.0	77.1	45.5	3.5
1898	29,467	—	3.4	3.4	—	30.6	13.6	51.0	224.5	146.1	44.2	88.4	74.9	10.2
1899	30,251	—	6.6	26.4	19.8	26.4	16.5	92.4	202.0	264.0	39.6	85.9	89.1	3.3
1900	31,036	32.2	—	12.9	6.4	25.8	9.6	161.0	220.8	233.6	54.5	67.6	48.0	12.9
1901	31,022	—	12.9	19.3	3.2	28.8	9.6	135.2	195.2	147.0	38.4	108.9	44.8	3.2
1902	31,008	—	3.2	22.4	22.4	24.6	12.3	135.3	195.2	147.0	28.8	96.0	57.6	9.6
1903	30,994	3.2	16.1	32.2	12.9	19.2	12.9	141.9	166.2	220.8	64.0	112.0	48.3	9.6
1904	30,980	—	9.7	16.1	—	3.2	9.7	156.4	182.6	284.8	64.0	131.1	70.5	9.6
1905	30,967	3.2	9.7	32.3	6.5	9.7	6.5	175.5	230.6	243.5	48.0	134.2	70.5	6.5
1906	31,655	9.5	—	6.3	31.5	31.5	15.7	132.2	201.6	223.7	66.5	116.5	53.6	9.5
1907	32,313	3.1	6.2	12.4	6.2	21.7	15.5	167.2	167.3	313.6	74.5	145.8	80.6	9.3
1908	32,971	6.1	24.4	3.0	12.2	21.0	3.0	177.0	213.0	204.0	57.0	144.0	36.6	9.0
1909	33,629	8.9	11.9	8.9	17.8	35.6	20.8	181.1	160.1	287.9	77.2	125.6	47.6	8.9
1910	34,259	17.5	2.9	23.3	2.9	24.3	8.7	354.0	136.2	322.0	49.3	139.1	99.6	14.5
1911	34,639	—	—	17.3	20.2	14.4	11.5	242.0	164.0	271.0	52.0	118.2	66.3	8.6
1912	35,020	11.4	5.7	11.4	17.1	2.8	2.8	205.5	179.7	317.0	37.1	105.3	82.7	11.4
1913	35,400	5.6	31.1	11.3	2.8	11.3	11.3	183.3	144.0	245.9	11.3	138.2	65.0	2.8
1914	35,781	—	19.6	5.6	16.8	2.8	2.8	153.9	204.0	333.0	38.2	111.9	63.4	14.0
1915	36,161	16.6	11.1	5.5	16.6	—	11.1	199.2	221.5	429.0	47.1	24.9	85.9	33.2

TABLE V.
QUINCY, MASS.

Year.	Population.	Deaths.	Death-rate.
1890	16,723	355	21.2
1891	17,521	292	16.6
1892	18,319	288	15.7
1893	19,117	349	18.2
1894	19,915	356	17.8
1895	20,712	326	15.7
1896	21,349	339	15.9
1897	21,986	339	15.4
1898	22,623	321	14.2
1899	23,260	357	15.3
1900	23,899	347	14.5
1901	24,744	325	13.2
1902	25,579	408	16.0
1903	26,414	362	13.7
1904	27,249	349	12.8
1905	28,076	368	13.1
1906	28,989	385	13.3
1907	29,902	389	13.0
1908	30,815	379	12.3
1909	31,728	389	12.2
1910	32,642	386	11.8
1911	34,248	396	11.5
1912	35,855	381	10.6
1913	37,461	479	12.8
1914	39,067	460	11.8
1915	40,674	552	13.6

TABLE VI.
QUINCY, MASS.

Year.	Population.	Births.	Birth-rate.	Infant deaths.	Infant mortality.
1890	16,723	560	33.4		
1891	17,521	649	37.0		
1892	18,319	613	33.4		
1893	19,117	716	37.4		
1894	19,915	660	33.1		
1895	20,712	645	31.2		
1896	21,349	713	33.4		
1897	21,986	685	31.2		
1898	22,623	776	34.2	82	105
1899	23,260	707	30.4	108	153
1900	23,899	752	31.4	81	108
1901	24,744	709	28.6	65	92
1902	25,579	745	29.2	96	129
1903	26,414	773	29.2	76	98
1904	27,249	765	28.0	77	100
1905	28,076	767	27.3	82	107
1906	28,989	850	29.4	96	113
1907	29,902	832	27.8	94	113
1908	30,815	842	27.3	95	113
1909	31,728	860	27.1	83	97
1910	32,642	874	26.7	90	106
1911	34,248	903	26.3	92	102
1912	35,855	893	24.9	73	82
1913	37,461	936	25.0	101	108
1914	39,067	1007	25.8	76	75
1915	40,674	1119	27.5	93	83

TABLE VII.
DEATHS FROM SPECIAL CAUSES IN QUINCY, MASS.

Year.	Population.	Measles.	Scarlet fever.	Diphtheria.	Whooping-cough.	Typhoid fever.	Dysentery.	Diarrhea, all types.	Tuberculosis.	Pneumonia.	Bronchitis.	Apoplexy.	Accident.	Alcoholism.
1890	16,273													
1891	17,521	2	—	4	—	5	—	25	50	18	8	13	13	1
1892	18,319	1	2	10	—	7	—	14	51	17	6	13	17	1
1893	19,117	2	6	9	—	11	—	18	50	34	14	6	18	1
1894	19,915	—	1	32	7	7	1	29	48	24	9	14	11	1
1895	20,712	—	5	16	2	7	—	19	47	18	7	10	12	1
1896	21,349	—	3	14	1	8	1	24	41	21	8	13	10	—
1897	21,986	3	2	2	—	5	4	15	38	41	8	15	13	2
1898	22,623	4	—	2	2	4	—	9	33	32	8	10	19	—
1899	23,260	2	—	9	5	9	3	23	50	25	16	15	16	3
1900	23,899	1	—	19	2	4	2	13	45	33	13	14	14	1
1901	24,744	—	—	8	5	2	1	25	38	23	8	17	12	2
1902	25,579	1	1	14	1	5	—	38	42	34	12	21	24	2
1903	26,414	1	—	11	7	2	2	22	29	31	10	12	18	2
1904	27,249	4	1	9	—	1	—	16	34	38	8	9	19	1
1905	28,076	—	3	12	—	3	—	21	40	38	6	15	17	2
1906	28,989	1	—	9	9	1	2	20	46	38	14	15	22	3
1907	29,902	1	3	6	—	—	—	30	36	41	5	19	19	2
1908	30,815	—	—	9	—	3	—	16	26	34	7	17	25	2
1909	31,728	—	—	2	1	3	—	19	42	31	1	19	30	—
1910	32,642	3	3	3	—	3	2	29	33	57	4	21	17	—
1911	34,248	1	7	7	2	2	—	29	33	33	4	19	21	3
1912	35,855	1	—	3	—	2	1	26	31	21	7	24	26	1
1913	37,461	2	—	8	5	3	—	25	34	60	6	37	33	4
1914	39,067	1	3	7	2	2	—	18	51	54	8	16	28	2
1915	40,674	2	5	4	3	2	1	31	47	45	5	6	44	3

TABLE VIII.
SPECIFIC DEATH-RATES FOR CERTAIN DISEASES IN QUINCY, MASS.

Year.	Population.	Measles.	Scarlet fever.	Diphtheria.	Whooping-cough.	Typhoid fever.	Dysentery.	Diarrhea, all types.	Tuberculosis.	Pneumonia.	Bronchitis.	Apoplexy.	Accident.	Alcoholism.
1890	16,273													
1891	17,521	11.4	—	22.8	—	28.5	—	142.5	284.0	102.6	45.6	74.2	74.2	5.7
1892	18,319	5.4	10.9	54.5	—	38.2	—	76.4	278.0	92.7	32.7	70.9	92.8	5.4
1893	19,117	10.4	31.2	47.0	—	57.5	—	94.0	261.5	177.6	73.2	31.2	94.0	5.2
1894	19,915	—	5.0	160.4	35.1	35.1	5.0	145.3	240.7	120.3	45.0	70.3	55.2	5.0
1895	20,712	—	24.1	77.3	9.6	33.8	—	91.8	226.5	82.0	33.8	48.2	58.0	4.8
1896	21,349	—	14.1	65.6	4.7	37.4	4.7	112.2	192.0	98.4	37.4	60.9	47.0	—
1897	21,986	13.6	9.1	9.1	—	22.7	18.2	64.3	172.8	186.6	36.4	64.3	58.2	9.1
1898	22,623	17.6	—	8.8	8.8	17.6	—	39.8	145.7	141.2	35.2	44.1	83.8	—
1899	23,260	8.6	—	38.6	21.4	38.6	12.7	98.8	214.4	107.2	68.8	64.5	68.8	12.7
1900	23,899	4.2	—	79.5	8.4	16.7	8.4	54.4	188.2	138.0	54.5	58.5	58.5	4.2
1901	24,744	—	—	32.3	20.2	8.1	4.0	101.0	153.4	93.0	32.3	68.7	48.5	8.1
1902	25,579	3.9	3.9	54.8	3.9	19.5	—	148.7	164.4	133.0	47.0	82.2	94.0	7.8
1903	26,414	3.8	—	41.6	26.4	7.6	7.6	83.2	113.8	117.0	37.8	45.3	68.0	7.6
1904	27,249	14.7	3.7	33.0	—	3.7	—	58.6	124.7	139.2	29.3	33.0	69.7	3.7
1905	28,076	—	10.7	42.8	—	10.7	—	74.9	142.6	135.2	21.4	53.5	60.6	7.1
1906	28,989	3.5	—	31.2	31.2	3.5	6.9	69.0	158.8	131.1	48.4	51.8	76.0	10.3
1907	29,902	3.2	10.0	20.0	—	—	—	100.0	120.0	137.0	16.7	63.5	63.5	6.5
1908	30,815	—	—	28.2	—	9.4	—	51.8	83.3	110.0	22.6	55.0	81.0	6.5
1909	31,728	—	—	6.3	3.1	9.4	—	59.9	132.2	97.8	3.1	59.9	94.6	—
1910	32,642	9.2	9.2	9.2	—	9.2	6.1	88.8	100.9	177.2	12.2	64.3	52.0	—
1911	34,248	2.8	20.4	20.4	5.8	5.8	—	84.6	96.3	96.3	11.7	55.4	61.2	8.7
1912	35,855	2.8	—	8.1	—	5.6	2.8	72.5	86.4	58.6	19.5	66.9	72.4	2.8
1913	37,461	5.3	—	21.3	13.3	8.0	—	66.7	90.8	160.0	16.0	98.7	88.0	10.7
1914	39,067	2.5	7.7	17.9	5.1	5.1	—	46.1	130.7	138.3	20.5	41.0	71.7	5.1
1915	40,674	4.9	12.3	9.8	7.4	4.9	2.5	76.4	115.6	110.7	12.3	14.7	108.1	7.4

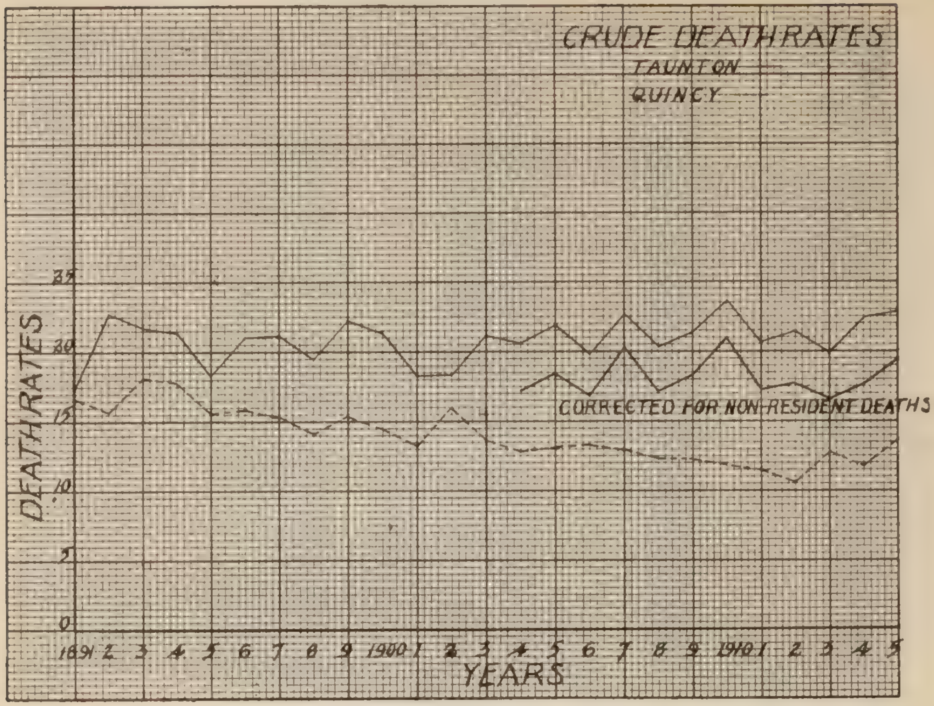

Chart I

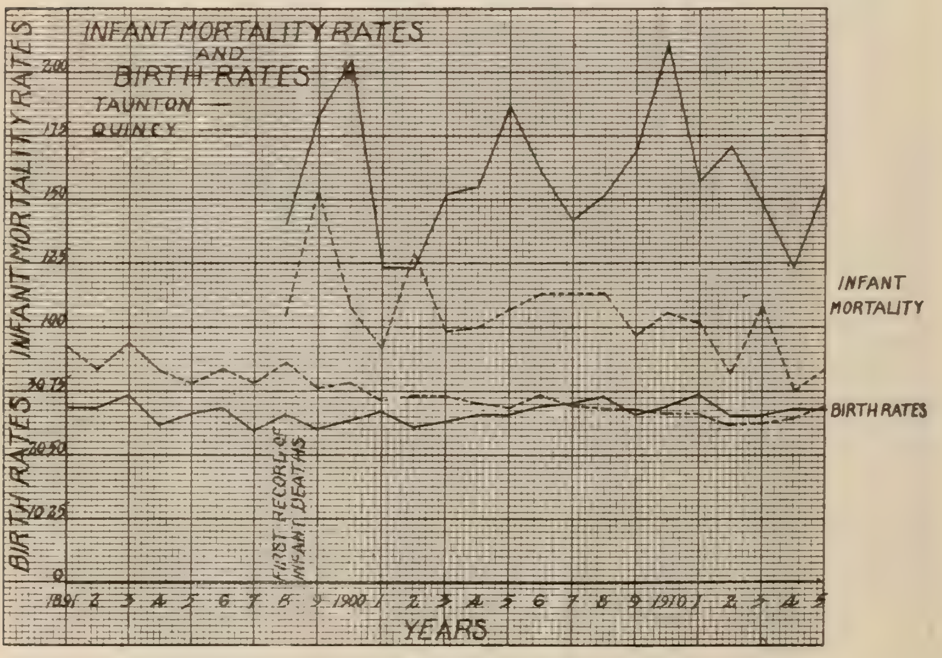

Chart II

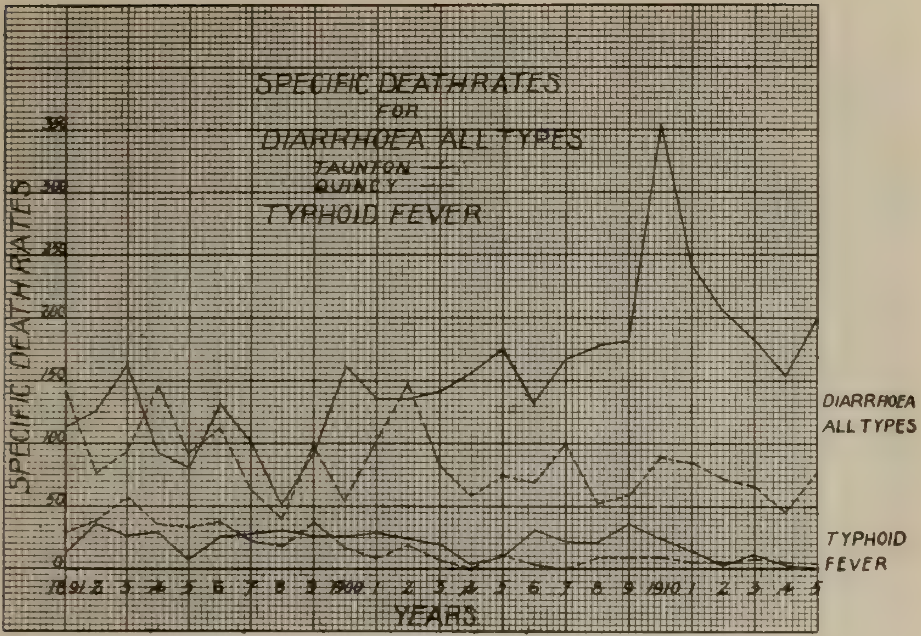

Chart III

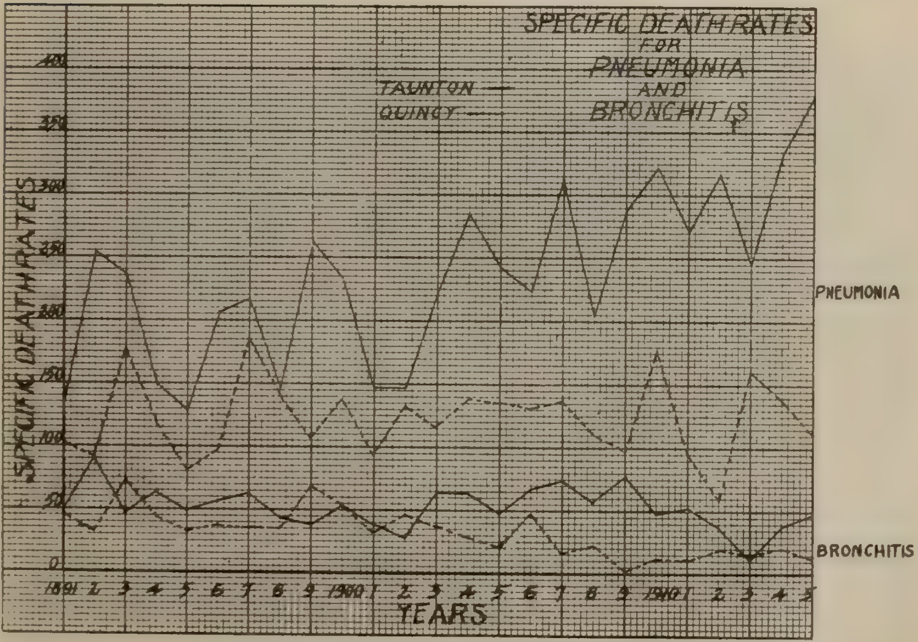

Chart IV

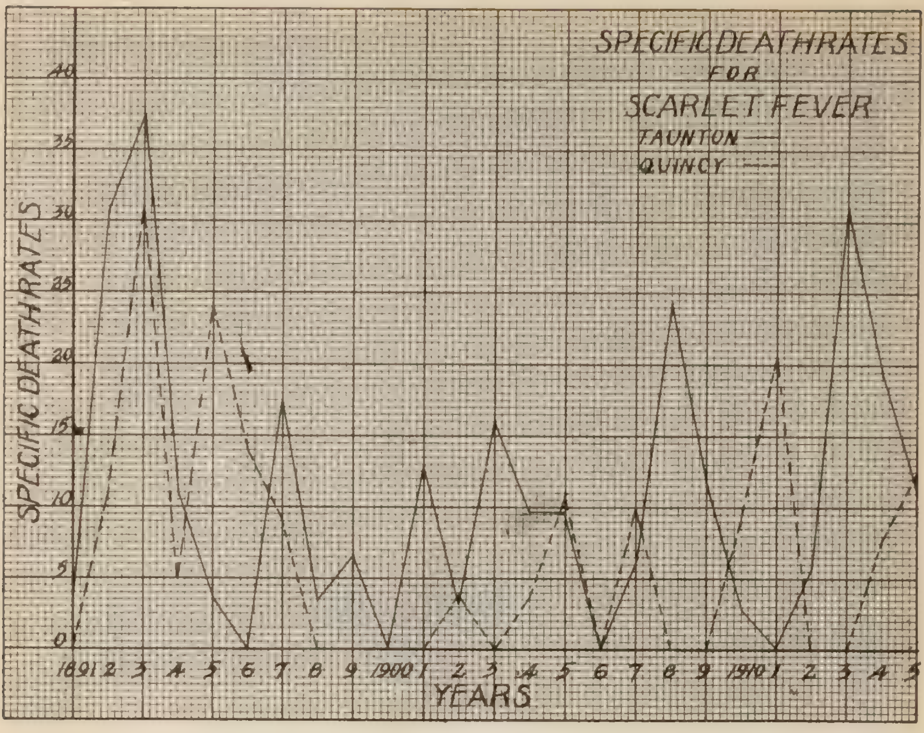

Chart V

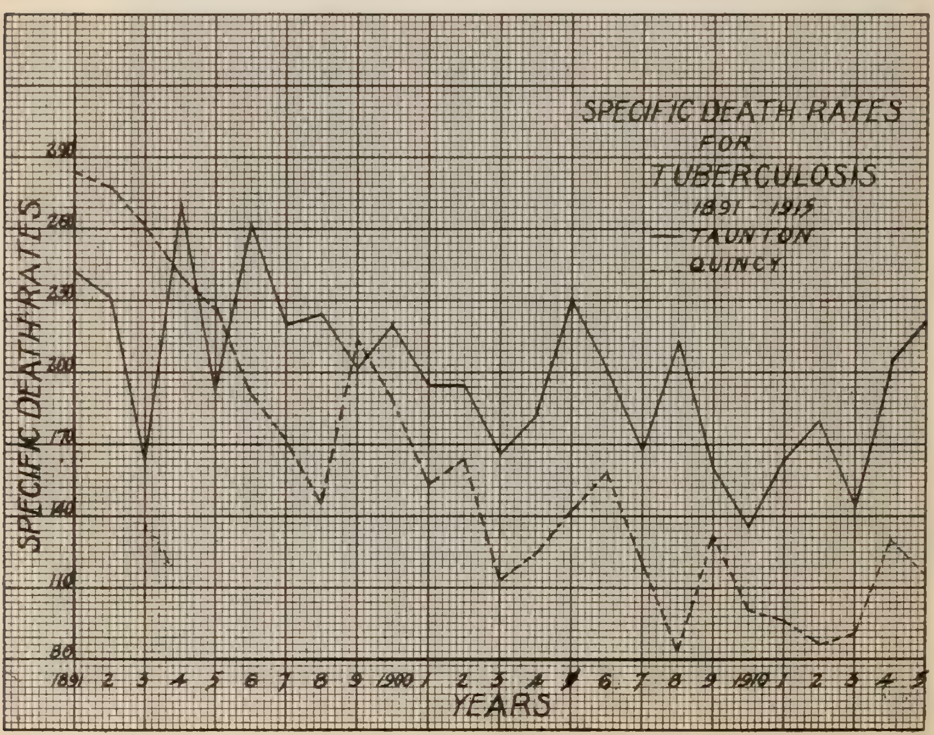

Chart VI

Book Reviews.

Mental Conflicts and Misconduct. *By William Healy. Boston: Little, Brown and Company, 1917. Pp. XI+330. Price, $2.50 net.*

In this book the author presents a rich case material derived from his studies at the Juvenile Psychopathic Institute of Chicago. Starting with delinquency as a problem of conduct requiring investigation, he was led from the delinquent act and its setting far back in the life of the child to factors which had often escaped notice completely. The actual delinquent behaviour was often seen to be the result of a certain tension to which a great many factors contributed. In such cases, therefore, the delinquent act was to be looked upon more as symptomatic of mental tension requiring treatment than as a motivated purposeful act to be judged purely by ethical standards and dealt with by cut and dried legal methods.

In the frank discussion with the delinquent of his complex driving trends, the author continually was struck by the prominence of the rôle played by the sexual trends represented either by sexual experiences, or sexual curiosity, or sexual ruminations of varied origin.

The detailed cases are presented in chapters five to sixteen, dealing with delinquents presenting conflicts in which sexual interests usually play a prominent rôle, and showing such behaviour as stealing, running away and anti-social conduct of varied nature.

The practical result of this type of investigation was found to be quite important, the sympathetic review with the delinquent of the underlying factors frequently bringing to an end, at least temporarily, the delinquent conduct. The author uses this therapeutic criterion to reinforce his contention that the delinquency in many of these cases is the result of the tension in the delinquent's life due to conflicts between sexual interests and the repressing forces.

The importance of this method of approaching early cases of delinquency with the use of free associations is fully borne out by the valuable data of the book. The histories of these cases with the spontaneous accounts take us deep down to the basal biological factors at the root of their behaviour. At the same time the author formulates the causal connection in what appears to be too simple a manner. In these delinquents with their stealing, fugues, lying, etc., the sexual data are prominent. This does not, however, mean that the sexual interest or strivings or repressions are to be too closely knit up with the delinquency in a causal nexus. It is, perhaps, too simple a formulation to say that a mental conflict chiefly related to the sexual sphere causes the theft or other misdemeanor. In many cases it rather appears that the child with considerable difficulty in general adaptation, suggestible to various influences, has at the same time indulged in delinquent acts and had trouble with sex feeling. That is only what one would expect; the child of somewhat poor balance in unfortunate circumstances, who gives in to some delinquent act, shows a constitutional or acquired weakness which is also going to be the cause of trouble in assimilating any sexual suggestions or experiences.

The case records in which the delinquents themselves seem to emphasize the causal connection between sexual thoughts and strivings, and the resulting theft, are not to be taken as final evidence. There is a certain suspicious similarity of the confessions of these delinquents, which suggests an atmosphere to which they have readily responded with their precocious intuition. In these cases as with hysterical patients, there is a tendency for a school to be developed, and to have all the patients show a classical series of symptoms. In Charcot's time at the Salpêtrière the patients were expected to present a certain classical picture and they lived up to these expectations. Change of medical views led to the almost complete disappearance of the previously familiar clinical pictures.

The author himself calls attention to the easy fabrications of some of these patients, the pseudologia which is so familiar in the hysterical, the psychopathic and children. Especially in those cases where the stealing is described by the delinquent as following a bad word which tends to come into his mind, one feels it safer to reserve his opinion. There is a danger in all such investigations of being carried away by the hunt for a universal formula which will fit all cases. The author's psychological formula corresponds somewhat to the French detective formula of "cherchez la femme."

Although one may feel that the author has generalized rather widely, the book is undoubtedly a very valuable contribution to criminology and to psychology; it is a pioneer work of very considerable importance.

C. Macfie Campbell.

The Psychology of Special Abilities and Disabilities. *By Augusta F. Bronner. Boston: Little, Brown and Company, 1917. Pp. VI+269. Price, $1.75 net.*

Of recent years much attention has been paid to the standardization of the intelligence level of children; the resultant tendency is to pay too much attention to the final score summing up the child's intelligence, and to neglect the fact that the score may absolutely conceal the great variation between the abilities of the child in different directions. The author deals especially with these problems; she discusses the problem of the child who is normal in many respects, but who shows very special disability in other respects. She also takes up the problem of the child who is subnormal on the whole, but who may show rather special abilities in one direction or another.

In her discussion of these problems the author presents many case histories and takes up in detail the psychology of learning arithmetic, of learning to read and spell, and reviews in some detail a great number of special functions. The amount of case material presented is rather large and disproportionate to the importance of the issues raised. Most workers have easily at their disposal relevant personal material, which makes such a large amount of case material unnecessary. The book would have gained considerably by condensation and by the main problem being brought to a clearer focus. For those who wish, however, a review of the various topics without any special new contribution, or solution, there is much of interest in the book. While it contributes little that is new to the psychologist, it is somewhat too detailed to be of much practical use to the teacher; for example, out of twelve pages in which reading is discussed, eight are devoted to a discussion of so-called congenital mind-blindness, which seems rather disproportionate. The general outlook of the book is sound and healthy; the author does much to counteract prevailing schematic views and to bring home the necessity of the study of the individual child, and the study of the different functions of each individual child in their independent variations.

C. Macfie Campbell.

Studies on the Digestion of a Sewage-Filter Effluent by a Small and Otherwise Unpolluted Stream. *By Robert S. Weston and C. E. Turner. Cambridge, Mass.: Massachusetts Institute of Technology.—Contributions from the Sanitary Research Laboratory and Sewage Experiment Station. Volume X. Price, $1.00.*

This volume of the "Contributions" represents, as the title indicates, a study of rapid self-purification. The river selected for the study is the Coweeset, which receives the partially purified sewage from the city of Brockton, Massachusetts, a city having a population of 64,000. The investigation was carried on by Prof. Robert Spurr Weston and Mr. C. E. Turner of the teaching staff of the Massachusetts Institute of Technology.

Thorough chemical and planktological examinations proved that the small river was able to digest the partially purified sewage of Brockton within the first three-fourths of a mile of its course. The digestion was found to be extremely sensitive to conditions such as temperature and rainfall. Detailed tabulations of the chemical and biological findings, as well as photographic reproductions and technical sketches accompany the report, which covers approximately 100 pages. The report represents a valuable contribution to the study of self-purification of polluted streams.

Too little attention has been paid heretofore in this country to the importance of plankton in the digestion process largely because such a study requires the attention of experts. A thorough planktologic analysis is laborious, and the vast majority of sewage- and water-chemists engaged in practical work are not competent to do it. The German and English school has long recognized the extreme importance of plankton in the process of self-purification, and the valuable deductions to be drawn from qualitative and quantitative plankton analyses. It must be acknowledged, however, that an investigation, such as the one carried on by Messrs. Weston and Turner, as far as practical application is concerned, is mainly of local interest. Hardly ever are there two conditions which would be alike with reference to volume and character of sewage as well as flow and biology of receiving stream. A great many factors enter into such an investigation which make it very difficult to apply the results obtained in one locality to another. Many more such investigations should be made in various localities, and the one discussed here may well serve as guide.

Arthur Lederer.

Food Poisoning. *By Edwin Oakes Jordan. The University of Chicago Press, 1917. Pp. 107, ills. 10. Price, $1.00.*

The author, a bacteriologist of note, has, naturally, discussed the subject from the bacteriological viewpoint, nearly all the detailed treatments being of that nature. The extent of food poisoning is but little known, and the author states that it may be responsible for certain of the degenerative diseases. He subscribed to a press clipping bureau for two years and obtained records of 1,032 cases, of which 657 were groups and 375 were individual. In all, 5,238 individuals were involved. The analysis of these reports is tabulated. The validity of this method of collecting statistics may be questioned, particularly in view of the statement on page 8 that the National Canners' Association during 1916 investigated fifty-one of these "libels on the industry" and found the alleged poisoning could not be traced to canned goods, as reported.

Anaphylaxis is described in an interesting manner and a number of examples, particularly those relating to egg poisoning, are given. Poisonous plants (conium, cicuta, mushrooms), poisonous fish and poisonous minerals are briefly discussed and food antiseptics more extensively discussed, giving a review of the celebrated benzoate controversy. The author cites the possibility of the high death-rate from degenerative diseases of the kidneys, blood vessels and other organs being in part caused by the irritating qualities of these "chemical" preservatives.

Food poisoning by pathogenic bacteria is described in some detail. Typhoid infection by carrier and otherwise, asiatic cholera infection, paratyphoid infection and infection by *enteritidis*, including many examples, are given, as well as a discussion of the relation between the two latter forms of infection. The author also cites the means of avoiding these various infections.

A short chapter upon animal parasites is followed by a longer one on poisonous products formed in food, in which botulism and its bacteriology is discussed. Regarding decomposed foods in general the author thinks that there is lack of evidence as to their dangerous qualities and cites cheese, sour milk, ripened meat and Chinese "eggs" as examples of such food consumed with impunity. The book closes with a short chapter on poisoning of obscurer unknown causes, deficiency diseases and a summary of foodstuffs most liable to cause infection or sickness.

The book is written in good English in an entertaining and concise manner.

Hermann C. Lythgoe.

Standard Methods for the Analysis of Water and Sewage. *Third Edition. 1917. Thoroughly revised. Obsolete methods dropped. Many new methods added. Send $1.25 to American Public Health Association, 126 Massachusetts Ave., Boston.*

Health Department Reports.

Montclair, New Jersey.

With the exception of the epidemic of infantile paralysis, the health conditions of this city of 25,000 population were very satisfactory during 1916 as set forth by the Twenty-second Annual Report of the Montclair Board of Health. The number of cases reported of diphtheria, scarlet fever, and typhoid fever were low, and there resulted only four deaths during the year from these diseases in addition to measles and whooping cough. Of the 272 deaths, 90 were caused by organic diseases of the heart, Bright's disease, cerebral hæmorrhage, and diseases of the arteries, which is the largest number in any one year thus far reported, and represents an increase of 30 per cent. over the number from like causes five years ago. Over 9 per cent. of the deaths were due to cancer, an increase of 100 per cent. in the last fifteen years. The corrected death-rate was 10.56 per 1,000 inhabitants. In this connection it is interesting to note that the reader is warned that the comparison of the crude death-rates of two different communities does not produce a fair comparison of the relative sanitary conditions of the two cities, and that a true comparison can only result from a study of the causes of death, in conjunction with the ages at which the deaths occurred.

The number of cases of infantile paralysis reported in Montclair numbered 32, or 1.24 cases per 1,000 inhabitants. Careful study was made of the incidence of poliomyelitis, and though much of what was discovered has previously been reported, the account here given well demonstrates the zeal and thoroughness of this town's investigation. It is interesting to note that as a result the Board of Health feels that many of the precautionary measures in the matter of quarantine, etc., instituted during the recent epidemic are unnecessary and ineffective, and will not be enforced during the present year if like circumstances prevail. The expenses of the epidemic amounted to nearly 40 per cent. of the entire expenditures for the department during the year. It is well to know that in the light of last year's experience any future circumstances of this nature will not cause such a drain upon the department's finances.

There were only eight cases of typhoid fever reported, with no deaths, during the year, and of these eight, five cases were traced to out-of-town sources of infection. The number of cases of measles reported was the second largest in the history of the town. It is unfortunate that in this connection the department believes that "it is next to impossible to control it," since somewhat recently it has been demonstrated that the course of the disease can at least be curbed by the careful observance of the children during the first hour of school for any initial symptoms, especially for any rise of temperature, and upon that basis the child to be excluded for the day. Malarial incidence continued low, only seven cases being reported. There were 78 cases of tuberculosis reported, an increase over the previous year of 8 cases, the increase being due to the larger number of non-pulmonary cases, due to the fact, it is believed, that it is only recently that these cases have been reported with any degree of completeness. Some 30 per cent. of these cases were under 15 years of age. Because of the large number of cases in which there has been direct infection of a child from another case in the same family, the attempt has been made to enforce the regulation that children under 16 years of age shall not live in an apartment in which there is a case of tuberculosis unless every precaution is taken to prevent any possible transfer of the infection. There were 27 deaths from this disease. Considerable incidence from whooping-cough and chickenpox was reported.

The infant mortality rate was 61 per 1,000 births, the lowest on record. Exclusive of the colored and Italian population of the town, the rate would amount to only 40. While no doubt many factors have been at work to obtain this most creditable rate, there seems to be no question but what the different activities of the Board have been responsible for a large share of this conservation of infant life.

Believing that if terminal disinfection were abolished many parents would be careless long before the danger period was over, this town has adhered to the policy of room disinfection in the case of all communicable diseases, though there seems to be a letting-up of this practice in the case of scarlet fever.

The supervision of milk and cream has still retained its excellence, and the ordinances previously made have thus far proved sufficient.

The style of this report can be greatly commended. It well accomplishes its purpose to the people, and it is well to note that much of the superfluous matter found in many such reports is omitted. The financial statement deserves special commendation, for the appearance of such a statement in the form of functional items is a departure one is pleased to note in the reports of cities and towns of this size.

Province of Nova Scotia.

The Twenty-fourth Annual Report of the Department of Public Health of the Province of Nova Scotia, October 1, 1915–September 30, 1916, is the report of a territory comprised of two cities, Halifax and Sydney, thirty-five towns, and twenty-four municipalities, with a 1915 population estimated at 503,162, two thirds of which is accredited to the rural districts.

Throughout the text of this report,—and it is equally evident in many other Canadian reports—we cannot help but notice the unfortunate decrease in the efficiency of community health supervision. Either many of the physicians who formerly interested themselves in health work have gone "over-seas," or, if their work has proven of good quality, they have been called to fill positions with the troops and camps in Canada. The results incident to this unfortunate, though doubtless necessary, policy are obvious, and naturally the civic population must suffer correspondingly. Yet in spite of this we note in some instances a definite decrease in disease incidence. It is possible that the withdrawal of many public health workers from their civic duties has been more or less neutralized by the education and growing realization of the value of personal hygiene and community sanitation by the populace, particularly in the rural districts.

Only for the last two years have morbidity returns been made of the more common infectious diseases, and it is felt that these are too inexact to be of real value for purposes of comparison. However, death returns are available over a longer period, and the present death returns indicate that the death-rate for this Province is increasing. The general death-rate for 1915 is reported as 17.5 per 1,000 inhabitants for the cities and towns, and a rate of 13.7 for the rural districts. The deaths due to pulmonary tuberculosis and certain other infectious diseases showed a decrease for the reported year, though deaths from other causes has caused the rate to increase, thus pointing out the necessity of carrying health work into new fields.

Fortunately this Province escaped the epidemic of infant paralysis which swept over the eastern part of the continent last summer, only twelve cases being reported as against 19 for the previous year. It is worthy of citing the report in this instance. Commenting on the seriousness of this epidemic, the report states "Serious as the epidemic of infantile paralysis has been, it has created an interest and demand for preventive action, which is quite disproportionate to its real importance. This is not so regrettable as the fact that other conditions, which are not occasional, but are constantly amongst us, are looked upon with such unconcern." The Provincial Health Officer has in mind the ravages committed by tuberculosis and diseases of early infancy, which has caused no little concern in this district. Though the death-rate from pulmonary tuberculosis has been cut down from a rate of 1.97 per 1,000 in 1911 to 1.30 per 1,000 in 1915, the death-rate from other forms of tuberculosis was reported as exceptionally high. In 1915 there were recorded 92 deaths as due to epidemic cerebro-spinal meningitis. Also 86 deaths were attributed to tubercular meningitis and 57 to simple meningitis, which deaths possibly were due to epidemic cerebro-spinal meningitis, diagnostic distinction being difficult. Morbidity reporting in this instance is most unsatisfactory. A virulent type of measles prevailed in the Province during the recorded year, 2,680 cases being reported. The actual number of cases was undoubtedly higher, since many returns gave no indication of numbers. A high mortality rate developed, due somewhat to complication, in many instances, with broncho-pneumonia. Typhoid fever, though still much too common, has been decreased in its incidence fully 25 per cent. from the previous year. During the recorded period, 260 cases were reported. During 1914–1915 there were 59 deaths from typhoid in the Province.

The chief problem which this Province must consider is that of infant welfare and the control of diseases of early infancy. In Halifax alone, where the birth registration is probably complete, the infant mortality rate is more than double that of New York City or most any other American city, namely 203 per 1,000 living births. For the cities and towns of this Province there is a general infant mortality rate of 158.4, with a maximum reached by the town of Hantsport of 222.2. Fortunately the rural communities, with a rate of 83.4, bring down the general infant mortality rate for the entire Province to 117.4. It further appears that in some cities and towns the rate for the last several years has been increasing. It is believed that the badly supervised milk supplies of the cities are largely to blame for this excessive rate, though, too, wretched housing conditions and poverty are believed to be a powerful contributing factor. The recently enacted Workmen's Compensation Act and Town Planning Act will greatly improve the existing conditions. Certain towns and cities have adopted drastic Milk By-Laws, and it is hoped that by energetic supervision the infant death-rate will be diminished.

One of the most important amendments suggested by the Provincial Health Officer, Dr. W. H. Hattie, is that the appointment of medical health officers be for more than a period of one year. At present it is the custom of many of the town and city councils to make a new appointment each year. Such a frequent change of office personnel cannot obviously preserve efficiency of the departments.

It is probable from the report of the bacteriological laboratory that many of the physicians of the Province are not taking advantage of the undoubted assistance to be obtained from it, though it is pleasing to note that the samples submitted have increased over the previous year and that new sections of the Province are being heard from.

As willing as is this great British colony to sacrifice itself for the victorious ending of this Great War, and hence to give first consideration to the means whereby victory can be brought about, Doctor Hattie's comment that "it is regrettable that so little thought should be given to the fact that the sacrifice of life on the battlefield constitutes a very special need for the saving of life at home" is well deserved and should be understood as a word of warning to all concerned.

Public Health Notes.

Public Comfort Stations.—W. R. Howe, writing in *Good Health* for July, 1917, emphasizes the need of public comfort stations and their importance as a factor in the health of a community. Too often the saloon and other questionable places are the only form of comfort available to touring parties and to other people who do not know of whatever private facilities may be known to citizens of the community.

There is an indirect influence upon the health through moral contamination when such places are frequented in search of public comfort. There is also the more direct influence that goes with restraining the processes of Nature to the point of suffering. This cannot be done without great harm to the body, not only because it injures the system, but also because it paves the way for constipation and all the evils that follow in its train.

No little care should be exercised in locating these stations. The mistake should not be made of regarding them as a thing to be kept out of sight, and to be modest about.

Every community, no matter how small, should give this important matter the attention which it deserves.

Expectant Mothers in Munition Factories.—The *Medical Officer* for June 23, 1917, prints some conclusions which the French *Académie* has reached in connection with the employment of married women in industries, particularly in munition factories.

Prospective or nursing mothers should be given work requiring only moderate effort in form and duration. Work exposing the women to slow or abrupt traumatism, and to fatigue and insufficient sleep should be prohibited. A six hour day should be the maximum for these workers, and night work should not be permitted. During the last four weeks of pregnancy, the mother should not be permitted to work. A physician should be available for consultation in the factory at all times, and a woman superintendent should look after the hygiene of the women workers. Provision should be made for factory women to suckle their own babes. The pregnant or suckling mother who is compelled to stop her work should be remunerated by the state. Unless it is absolutely necessary, it is recommended that mothers should not be employed industrially.

⁂

Sanitary Control of Bathing Beaches.—In the June number of the *Ohio Public Health Journal*, W. H. Dittoe points out the necessity for supervising bathing beaches which have come so much into public favor.

The replies received from thirty-eight state health departments show that such bathing places are not supervised or controlled. Twelve of the states claim that typhoid fever and other intestinal diseases are known to have been transmitted in bathing at the public beaches.

Not only is it necessary that the water used for bathing should be of drinking quality, but every effort should be made to prevent pollution of these waters by discharging sewers or the wastes from the houses on the shore. Contamination of the waters by the bathers themselves should be minimized. Adequate toilet facilities should be provided in the bath-houses, likewise a sufficient supply of safe drinking water. Means should also be provided for sterilizing suits and towels used by the bathers.

⁂

Garbage Analysis and Food Conservation.—An editorial in the *Journal of the Florida Medical Association* for July, 1917, urges the analysis of city garbage from week to week as an index of food saving or waste. Where there is no official chemist, local chemists can render great service to the nation by volunteering to make these analyses in their localities.

The usual garbage reduction or disposal methods waste and lose vast amounts of valuable foodstuff for animals. Dual collection of garbage and trash should be rigidly enforced, and greater use should be made of the garbage as animal food.

The American garbage pail receives too much edible material and it is believed that if the thrift idea is properly furthered, this amount may be reduced to an extent which will make reduction methods hardly worth while.

The people must face the facts and know the truth of their waste, and in bringing this waste home local chemists can render effective service.

This suggestion originated in the United States Department of Agriculture.

⁂

To Sterilize Milk Containers.—"To assist milk producers to reduce their losses from milk which sours in transit and to help them comply with bacterial requirements set by local health officers, the Dairy Division of the United States Department of Agriculture this coming season will demonstrate its home-made steam sterilizer for dairy utensils in a large number of milk-producing centers. Already the health authorities in 150 cities have asked the department to send these outfits for local demonstration.

"These outfits the department has offered to lend any local dairy official or health officer who will agree to demonstrate them in actual practice to milk producers in his locality. The outfits, which cost not over $15 and can be made by any local tinsmith, when placed on a range or a two-burner oil stove, generate steam enough to kill the bacteria in milk cans, pails, strainer cloths and separator parts. At the same time the device removes foul odors, leaves the utensils dry as well as sterilized, and adds materially to their life.

"Those interested in the subject can obtain Farmer's Bulletin 748 on application to the department."

This note was taken from *The Creamery and Milk Plant Monthly* for March, 1917.

New York Milk Committee.—The report for 1907–1916 summarizes the work that has been accomplished. The committee is interested in reducing the infant mortality rate in New York City, and in safeguarding the city's milk supply. During the past ten years, the infant mortality rate for New York City was reduced from 153 to 93 per thousand population.

Following are, in the main, the results accomplished.

The value of infant milk stations was established after careful experiments had been tried in selected and congested districts. Their educational value was demonstrated. Instruction in the home was attempted by visiting nurses with great success. The value of these experiments was so apparent, that New York City soon established 55 similar stations.

The committee proved that clean milk can be produced and sold at a price demanded for milk of uncertain quality. Routine laboratory control of the milk supply was urged. The value of prenatal care was demonstrated with 3,000 expectant mothers. A district health center was established in New York City in 1913, and its value demonstrated. Efforts have been made to control and eliminate bovine tuberculosis among dairy herds. Legislative bills that attempted to lower the standards for a safe milk supply were vigorously opposed. Surveys, reports, and investigations were made. Educational literature was distributed and other methods were employed to educate the people to a full appreciation of the value of a safe milk supply.

*

Fatigue and the Aged.—In the *New York Medical Journal*, Dr. A. L. Fish speaks of nervous and muscular fatigue and their effect on the aged.

When a muscle does work, the carbohydrate in the tissue is decomposed to form lactic acid, creatine and carbon dioxide. These substances are toxic and inhibit further contraction. When the muscles are flushed through the blood vessels by defibrinated blood or a weak salt solution, the fatigue products are removed. Fatigue products are acid in character, whereas the normal muscle in repose is alkaline.

The functions of the body are affected first in the circulation and respiration, and later in the digestion and the action of the kidneys.

In the case of individuals advanced in age, the tissues are more or less in a state of chronic fatigue, due to the wear and tear of the past years. Any added burden to the tissues produces fatigue products out of all proportion, and the result may be fatal.

*

Food Allowances for Healthy Children.—Miss Lucy Gillett of the N. Y. A. I. C. P. has studied this important subject and has reached certain conclusions which are recorded below.

It has been customary heretofore in estimating the food requirements of children to base these figures on the food allowance for a man. The food requirement of any individual depends on the age, size and activity of the individual in question. Hence the food requirement of any person should be based on these factors, and not on the requirements of a normal healthy man.

It is apparent that an adequate food allowance must not only provide energy for internal and external activities, but must support the increase in weight of a growing body.

The following table shows the food allowances for normal children. The limits given permit of individual variations in each city.

FOOD ALLOWANCES FOR CHILDREN.

Age in years.	*Calories per day.* *Boys.*	*Girls.*
Under 2	900–1,200	900–1,200
2–3	1,000–1,300	980–1,280
3–4	1,100–1,400	1,060–1,360
4–5	1,200–1,500	1,140–1,440
5–6	1,300–1,600	1,220–1,520
6–7	1,400–1,700	1,300–1,600
7–8	1,500–1,800	1,380–1,680
8–9	1,600–1,900	1,460–1,760
9–10	1,700–2,000	1,550–1,850
10–11	1,900–2,200	1,650–1,950
11–12	2,100–2,400	1,750–2,050
12–13	2,300–2,700	1,850–2,150
13–14	2,500–2,900	1,950–2,250
14–15	2,600–3,100	2,050–2,350
15–16	2,700–3,300	2,150–2,450
16–17	2,700–3,400	2,250–2,550

From the above table, the food requirements of an entire family may be determined, knowing the age, size and occupation of each member.

Public Health Clippings.

The Butcher's Lament.

The meat inspector is mine enemy, I shall not like him.

He maketh me to shoo out the flies and cover the sausage mill.

He showeth me the meat I shall sell, and that I shall not.

Yea, verily, tho' I scrub the ice box twice yearly, he sayeth it is not clean.

He kicketh if I keep hogs in the backyard and sayeth it is unsanitary.

He smelleth of my sausage and heaveth it in the slop barrel, even tho' it be but slightly sour.

He demandeth that I use not the larynx and mammae for sausage.

And he speaks in harsh tones if I disobey him.

I bring my meat to his office for inspection, wrapped in tree tops.

He turneth it down and insists that I wrap it in clean, white cloths.

Yea, verily, tho' mine hog grew up in mine own orchard, he condemneth it for cholera and fly-blows, and I lose twelve dollars and a half.

He hurls threats at me if I bring not the livers and "lights," and if I am slow about paying my bill at the month's end he maketh me bring the money at the time of inspection.

He anointeth my livers with kerosene and insisteth on seeing the hides and earmarks even tho' I tell him there is none.

Surely the words "Clean up and stay clean" will be hurled at me all the days of my life, and I shall live in fear of the inspector for ever and ever. Amen.—*Public Health* (Michigan) from *Mulford Vet. Bulletin.*

*

Who is Benefited by Public Health Work? The path of the health official is at best a dreary one. He must often, if not always, lead in measures which are distasteful sometimes to everyone in the community, even though in the interest of those who are antagonistic. A successful campaign to make the water supply of a city or town wholesome, an effort which may save the lives of a number of people is rewarded often by the publicly expressed opinion that "we have been drinking that water for years and no one died from it" or "water that was good enough for my father is good enough for me." It cannot be proved perhaps that "no one died from the water" yet it may be morally certain that they did.

The public would like to see in returns of dollars and cents the good accomplished by the health official, but it is the duty of this official to conserve and protect, that the public may have health, not sickness, and promotion of health is not to be measured in financial terms.

If, through patient and persistent work of the health officer, the death rate of a community is lowered, frequently it is not noticed by those most interested.—*Louisiana State Board of Health.*

*

The Roller Towel.

"Roll on, thou stiff and dark old towel—roll!
A hundred hands are wiped on thee each day;
Thou bearest mystic records, like a scroll,
And finger prints of all who passed thy way;
And where be those that said thou shouldst not stay,
The New York traveling men who bade thee hence,
The Kansas people, who did sternly say,
'Each his own towel—count not the expense,'
They pass—but thou still roll'st thy length immense."—*Judge.*

*

Do You Know That Insanity costs every inhabitant in the United States $1 per year?

Untreated pellagra ends in insanity?—Boston *Monthly Bulletin.*

*

Don't Dope the Baby with Paregoric.—Among the baby killers there is nothing so deadly as dope. In some households it is the custom to keep paregoric on hand for an emergency. Some mothers are thoughtless and careless enough to dope their babies with this drug whenever they cry. Occasionally a mother is so heartless and even criminal that she will dope her baby to make it sleep while she works or goes calling.

Paregoric contains opium, and babies are very susceptible to opium or its alkaloids, the chief of which are codein, heroin, and morphine. Careless dosing with such drugs has sometimes killed babies or led to other very serious consequences. Among other ill effects, opiates profoundly affect the digestive processes by retarding the secretion of digestive fluids. A baby's digestion is too important a function to be tampered with in this fashion. Perfect health, often even life itself, depends upon an unimpaired digestion.—North Carolina *Health Bulletin*.

⁂

Hygienic Sinners.

The waitress who carries a napkin under her arm and wipes off your plate with it.

The fruit stand owner who exhales on your apple and polishes it on his sleeve before he sells it to you.

The good old doc who still believes there ain't no such things as germs.

The cook who tastes from the pot and stirs with the tasting spoon.

The employer who does not supply adequate sanitary facilities for his help.

The street car conductor who holds the transfer slips in his mouth.

The restaurant toothpick.

The roller towel.

The barber who uses a styptic pencil.

The milkman who takes the temperature of the milk with his finger.—Cumberland *Health Bulletin*, partly from *Jour. A. M. A.*

⁂

Buddeized Milk.—Many German scientists who object to the pasteurization of milk in the belief that the process causes deterioration of the milk and renders it injurious to babies, now endorse a new method of manipulating milk which is known as "buddeizing." The process was introduced in Germany, and before the war, had been taken up in the Baltic provinces of Russia and in other parts of Northern European countries. By the "buddeizing" process milk is heated only to 122 degrees F., a small amount of peroxide of hydrogen being added before the heating. The peroxide is entirely evaporated in the heating and the germs are destroyed more completely, it is claimed, than by pasteurization, and no deterioration of the milk is caused.—*Bulletin*, Pennsylvania Department of Agriculture.

Flygrams.

It is a short haul from the garbage can to the dining table via the fly route.

It is better to screen the cradle and wear a smile than scoff at the precautions and wear mourning.

Flies in the dining-room usually precede nurses in the sick room.

Screen windows and prevent crêpe on the door.

A fly in the milk may mean a member of the family in the grave.

It costs less to buy a screen door than to get sick and lay off for a month.

Flies are a disgrace. They indicate nearby filth.

No filth, no flies, fewer flies, fewer dead babies.

How long will you continue to let the fly eat at your table?

Get the flies before they get you.

Lice are accidents, fleas are a nuisance, bedbugs are a disgrace but flies are a householder's own fault.

Do not buy fruit, meat, groceries, etc., where flies are tolerated. If the flies beat you to it, let them have it.

The fly is a home wrecker. Destroy it.

When the fly comes in the window, good health goes out the door.

If man were as persistent as the fly, there would soon be no flies.

If at first you don't succeed, swat, swat again.—Cumberland (Maryland) *Health Bulletin*.

⁂

Life Lines.

Swat the fly!
It carries germs upon its feet.
It wipes them off on food we eat,
And on the baby's lips so sweet,
Which makes her die; and that is why
We swat the fly—
The hateful, horrid, deadly fly!
—Cumberland *Health Bulletin*.

⁂

Some Health Sayings.

Public health is public wealth.—*Franklin*.

In the health of the people lies the strength of the nation.—*Gladstone*.

The care of the public health is the first duty of the statesman.—*Disraeli*.

Industrial Hygiene and Sanitation.

Miners' Consumption has been the subject of a study by A. J. Lanza of the U. S. P. H. S. The results of the study are contained in Public Health Bulletin No. 85 (U. S. P. H. S.). Four hundred and thirty-three cases of miners' consumption among zinc miners in southwestern Missouri came under close observation. It was found that miners' consumption is widely prevalent among the hard rock miners of the Joplin district, affecting probably 30 to 35 per cent. of them. The consumption is essentially a pneumoconiosis. The disability and other effects of miners' consumption are due primarily to silicosis, infection being usually a secondary, and often a terminal process. The incidence of tubercle infection in miners' consumption is a menace to public health, affording an unusual opportunity for the spread of tuberculosis. It is of great importance to improve the working conditions of the miners, and to carry on an intelligent educational campaign. The Roentgen-ray studies required in the course of the investigation were made by Dr. S. B. Childs.

⁂

Dependents of Enlisted Men.—Details pertaining to the "Care of Dependents of Enlisted Men in Canada" are available in Publication No. 25 of the U. S. Department of Labor, Children's Bureau. The pamphlet was prepared by Mr. V. S. Herbert Wolfe of New York, who visited Canada for that purpose. Mr. Wolfe discusses especially public provisions.

⁂

Welfare Work in British Munition Factories.—This bulletin (U. S. Dept. of Labor, Bureau of Labor Statistics, No. 222) is the second of a group of bulletins to be published by the Bureau of Labor Statistics of the U. S. Department of Labor in compliance with a resolution voted April 7, 1917, by the Council of National Defense. The Committee considering the problem concluded that "almost more important than the immediate or technical environment in which work is carried on and the length of hours during which the workers are employed," are four chief influences which affect industrial efficiency; namely, questions of housing, transit, canteen, provision, and individual welfare of the employees. Welfare supervision has already been undertaken in a number of munition factories, and testimony of managers is given commending the services rendered by welfare supervisors. Instances of the successful work of women supervisors are mentioned. The committee outlines the duties of welfare supervision in considerable detail. A dietary, containing a sufficient quantity of nutritive material, suitably mixed, easily digestible and obtainable at a reasonable cost, is essential. The establishment of industrial canteens is highly desirable. Those plants which already have such canteens report a marked improvement in the health and physical condition of workers, a reduction of sickness, less absence and broken time, less tendency to alcoholism, increased efficiency, and other mutual benefits. Leonard E. Hill, one of the members of the committee, paid particular attention to the workers' food and an ideal dietary. The minimum canteen diet may be taken to be about 3,000 calories per day. The cost of the meals analyzed ranged from 10.1 cents to 34.5 cents. With reference to washing facilities and baths the committee emphasizes the fact that cleanliness is very beneficial to the health and personal efficiency of workers. Provision should be made for an ample supply of hot and cold water. Baths and lavatories should be kept clean. Their care should be in the hands of an appointed officer acting under the welfare supervisor.

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Asphyxiation from Blast-Furnace Gas is the title of Technical Paper 106, Bureau of Mines, Department of the Interior, prepared by Frederick H. Willcox. The report discusses the nature and causes of poisoning from blast-furnace gas, itemizes the places where gas may be expected to be encountered, suggests safeguards and points out the precautions to be taken in working about gaseous places.

⁂

The Michigan Legislature rejected the health insurance bill urged by the American Association for Labor Legislation.

Communications.

To the Editor:

In an article in your June issue entitled "Military Sanitation in the Present War" by Thorndike Saville, C. E., appears the following statement under the heading "Water Purification":

"The British also advocate the use of the self washing filter cone, such as is used at Toronto. Theoretically it is most economical but no results from its use in the army are given and it has not been satisfactory at Toronto."

As the engineers who designed this 60 million Imperial gallon per day water purification plant for the city of Toronto, we have to say that a portion of the plant is now in operation but that no official tests have been made. A 500,000 Imperial gallon per day demonstration plant was built before the larger plant was decided upon and thoroughly tested by the city of Toronto bacteriologists with absolutely satisfactory results in every respect as will be observed from the Report attached covering these official tests.

Under these conditions the statement quoted above in reference to the Toronto plant is without foundation, absolutely unwarranted, as well as being false. Such a sweeping and damaging statement as contained in the article cannot possibly be based on facts. What object the writer had in view can best be left to the imagination.

We are not in a position to make reference to the results obtained from the filters used for war purposes further than to indicate that we continue to construct same for many of the Allied Powers.

Yours very truly,
John verMehr Engineering Company, Ltd.,
William Storrie,
Chief Engineer.

To the Editor:

I beg to acknowledge your courtesy in giving me opportunity to reply to the letter of Mr. William Storrie, Chief Engineer of the John verMehr Co., Ltd., in which he takes exception to certain statements appearing in my article "Military Sanitation in the Present War."

The statement to which Mr. Storrie takes exception came to me from what I considered a most authoritative source, although as I remember the matter was only referred to conversationally. As my informant is now absent from the country, I am unable to verify my understanding of the statement. The only assertion from which Mr. Storrie apparently has grounds for dissenting is found in the last few words, that "it has not been satisfactory at Toronto." Authority for this statement was not based on personal knowledge of the conditions, and as Mr Storrie states that no official tests have been made, undoubted injustice has been done, although in an entirely unintentional manner.

Under these circumstances I am very glad to have my article corrected, and trust that you will find opportunity to publish this letter in an early issue of the Journal.

Yours very truly,
Thorndike Saville.

Personal Notes.

Members and subscribers enlisting in the Sanitary Service, or other war divisions, are respectfully requested to inform the Editor, for notice in these columns.

*

Professor S. M. Gunn, editor of the Journal, has departed for France to become associate director of the Tuberculosis Commission of the International Health Board. Mr. A. W. Hedrich, for the past year editorial assistant, has been appointed acting editor and acting secretary to the Association.

*

Dr. Elmer S. Tenney of Boston, Mass., formerly of the Army Medical Corps, has accepted the position of health commissioner to the state of Nebraska.

*

Mr. W. Thurber Fales has been appointed health officer of Glen Ridge, N. J.

*

Mr. Franz Schneider, Jr., has resigned as sanitarian of the Department of Surveys and Exhibits, Russell Sage Foundation, to become associate health editor of *The Delineator*.

*

Dr. William L. Holt has been appointed instructor in hygiene and bacteriology in the Medical School of Western Reserve University.

The following have been elected to membership in the American Public Health Association:

Caldwell Woodruff, M. D., Hyattsville, Md., Deputy State Health Officer.

Wilson G. Smillie, M. D., New York City.

Miss Evelyn Peck, New York City, Manager, Department for Social Workers, Intercollegiate Bureau of Occupation.

Mr. L. R. Bartlett, Eastport, Me., Inspector and Bacteriologist, National Canners Association.

Mr. Jules Gagnon, Newburyport, Mass.

Mr. E. D. Reynolds, Danvers, Mass.

Miss Margaret McCluer, Bon Air, Va., Assistant City Bacteriologist of Richmond, Va.

Mr. Frederick E. Church, Milwaukee County Hospital, Wauwatosa, Wis., Assistant Bacteriologist and Pathologist, Milwaukee County Hospital.

Mr. Cassius L. Clay, Louisiana State Board of Health, New Orleans, La., State Analyst, Louisiana State Board of Health.

Miss Norma Burrell, South Haven, Mich., Bacteriologist in charge of Municipal Laboratory for examination of water and milk.

Mr. Herbert L. Wright, Kenosha, Wis., Health Commissioner.

Mr. Henry W. Lehmkuhl, New York City, Pharmaceutical Chemist (Columbia Univ.), Chief of Division of Food Inspection, Bureau of Food and Drugs, Department of Health, City of New York.

Mr. Hermann C. Lythgoe, Boston, Mass., Director, Food and Drug Division, Massachusetts State Department of Health.

Current Public Health Literature.

AMERICAN.

American Food Journal, Chicago.

XII. June.

Care of Confectionery. Walter C. Hughes.
Cold Storage Holdings of Foods.
The Food Manufacturer and the Law. Thomas E. Lannen and Thomas J. Hickey.
Home Canning by the Cold Pack Method.
The Use of Mixed Flour in Making Bread. E. H. S. Bailey and W. S. Long.

XII. July.

Analysis of Canned Salmon.
Food Values of Package Foods.
Food Conservation by the States. A Symposium by State Officials.
Food Wastage in New York. Isaac Russell.
Loss of Iron in Boiling.
Master Bakers Act to Stem Bread Waste.
Rice a Convenient Starchy Food.
Why Bread is Cheaper in France.

American Journal of Nursing, Baltimore.

XVII. June.

State After-Care of Infantile Paralysis. Kate Baker, R. N.

XVII. July.

Health Conditions in Prisons. Thomas M. Osborne.
The Nurse and Infectious Diseases. George W. Goler, M. D.
The Prevention of Diseases of Infants and Children. Ellen C. Babbitt.
How Can the Small Hospital Train Pupils Toward Public Health Nursing? Mary S. Gardner, R. N.
What Will Health Insurance Do for the American Citizen? Miles M. Dawson.
What Will Health Insurance Mean to the Insured? Pauline Newmann.
A Bird's-Eye View of Nursing History. Isabel M. Stewart.

American Medicine, New York.

XXII, No. 6. June.

Poliomyelitis. Editorial.
Industrial Prophylaxis. Editorial.
The Shortage of Nurses. Editorial.
Venereal Prophylaxis. Editorial.
Anthrax, An Occupational Disease. Editorial.
The Successful Management of Scarlet Fever. I. L. Van Zandt, M. D.

Boston Medical and Surgical Journal.

CLXXVI. June 28.

On Cranial Measurements of Persons.
Dying in Insane Hospitals. L. G. Lowrey.
Tetanus in War and Peace. Editorial.

CLXXVII. July 5.

Tuberculosis in the Army. Editorial.

CLXXVII. July 12.

The Control of Cancer of the Massachusetts Medical Society.

The Creamery and Milk Plant Monthly.

V. April.

Digestibility of Cheese.
Milk as a Food.
Cream Grading for Kansas.
The Care of Milk and Its Use in the Home.
Pasteurization of Market Milk.
Milk Topics.
A Report, "Coöperative Dairymen."
City Milk Supply.
Creamery and Milk Plant Ventilation.

V. May.

Controlling the Chemical and Physical Properties of Evaporated Milk.
The Dairy Problem.

Intervals Between Milkings and Their Influence on Milk.
Milk-borne Typhoid Fever.
The Clarification of Milk.
Tentative Standards for Milk Products.
A Controversy About Clarification. Editorial.

Journal of the American Medical Association, Chicago.

LXVII. June 30.

The Hospital Opportunities and Responsibilities to the Syphilitic. H. R. Varney.

LXIX. July 14.

Sanitation in the Trenches. C. C. McCulloch.
The Relative Values of Public Health Procedures. C. V. Chapin.
The Prevention of Endemic Typhus in California. J. G. Cumming and H. F. Senftner.

Journal of Laboratory and Clinical Medicine, St. Louis.

II. July.

The Bacteriology of Poliomyelitis. Horace Greeley.

Journal of Outdoor Life, New York.

XIV. July.

The Cur—A. T. B.'s Story.
The Will and Recovery. Frazer.

Medical Times, New York.

XLV. June.

Tobacco. B. F. Roller.
Tobacco Protein Allergy. Editorial.

The Modern Hospital, St. Louis.

IX. July.

State Care of the Feeble-Minded. J. M. Murdock.
Flavoring Extracts, Their Character and Composition. J. P. Street.
Institutional Economies for War Time.

New York Medical Journal.

CVI. July 14.

A Study of Sixty-Seven Cases of Epidemic Cerebrospinal Meningitis. D. F. Bentley, Jr.
Observation and Inspection in the Physical Examination in Pulmonary Tuberculosis. Charles Rayevsky.
A Special Investigation into the Poliomyelitis Epidemic in New York in 1916. Editorial.
Tuberculosis in the Soldier. Editorial.

CV. June 30.

Summary of the Wassermann Tests Done During 1916 in the Philadelphia General Hospital. R. C. Rosenberger.
The Effects of Fatigue upon the Aged. Arthur L. Fisk.

CVI. July 7.

The Army Medical Service. T. H. Goodwin.
Typhoid Forms in the Italian Army. Editorial.

The Nurse.

June.

The Forsyth Dental Infirmary for Children.
The Mission to Lepers. F. N. Hollingsworth.

Pediatrics.

XXIX. May.

The Cost of Child Labor. Editorial.
The Cow as an Agent of Diphtheria Infection.
Tuberculosis, A Disease of Children. F. C. Moor.

Public Health Reports.

Vol. 32. July 6.

Virulent Smallpox in Douglas, Ariz.
Poliomyelitis Reported in Ohio.
Outbreak of Dysentery in Arkansas.
Sewage Disposal under Rural Conditions.
Anopheles Punctipennis—Ability to Serve as Host for Plasmodium Falciparum.

July 13.

Trachoma and the Army.
Poliomyelitis in Japan.
Experimental Typhus in Guinea Pigs.

July 20.

Medical Care of Injured Federal Employees.
Quarantine Station, Philippine Islands.
Malaria in North Carolina.
Hay Fever in Rocky Mountains and Western States.

July 27.

Meningococcus Carriers—Recognition and Treatment.
Malaria in Louisiana.
Measles, Prevalence in 1916.

Public Health Nurse Quarterly, New York City.

IX. July.

The Public Health Nurse and the After-Care of Infantile Paralysis. Edith Swaine, Agnes M. Sjolund, Clara Johnson.
A Health Center in a Large City. Robert H. Bishop.
Teaching Problems of Public Health Instructors. Anne H. Strong.
Specialized Public Health Nursing. Cecilia A. Evans.
The Solution of Family Problems by Coöperation with other Agencies. Harmina Stokes.

Safety.

V, No. 4. April.

Success in Accident Prevention. Marcus A. Dow.
The Control of Fumes in Industrial Finishing Operations.
Reduction of Coal Mine Fatalities in the United States.

Safety Engineering, New York.

April.

Hazards of Locomotive Engineers. Frederick S. Crum.
Rescue Work at a Montana Mine.

June.

Humidity, Heat and Accidents. H. E. Ingram.
Hygiene, Sanitation and Physical Examinations. Wm. J. Erickson.

Social Hygiene, Baltimore.

III. January.

Clinics for Venereal Diseases, Why We Need Them; How to Develop Them. Wm. F. Snow.
A Health Exhibit for Men. F. J. Osborne.
Prostitution and Alcohol. Walter Clarke.
The Venereal Peril. Isaac W. Brewer.

Survey, New York.

XXXVIII. May 19.

A Red Cross Civilian Relief Plan.
Premature Old Age from the Trenches.
Nationalizing the Public Health.

XXXVIII. May 26.

Iowa's Child Welfare Station.
Tuberculosis Among the Rookies.

Trained Nurse and Hospital Review.

LIX. July.

The Conservation of the World's Teeth. A. New.
Occupation for Crippled Soldiers. Frank B. and Lillian M. Gilbreth.

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THE ILLEGAL PRACTITIONER, FAKERS AND CHARLATANS.

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St. Louis, Mo.

Read before the Public Health Administration Section, American Public Health Association, Cincinnati, Ohio, October 26, 1916.

THIS paper is intended to call attention to conditions found in the city of St. Louis relating to fraud and imposition on the sick and afflicted, by persons practicing medicine without being qualified to do so.

In the city of St. Louis prior to 1907, little if any thought was given this subject, although we had had some few complaints of deception and fraud. I do not now recall just what specific instance attracted our attention to the necessity of a full investigation of conditions, but whatever it was, the matter was more thoroughly looked into and sufficient facts were elicited to convince us the subject was worthy of careful survey.

We were far from realizing at the beginning what a really important matter this clandestine practice of the treatment of the afflicted was to be, and were astonished to find how great a number of fakers were fleecing the unfortunate, of not only their money, but their chances of regaining health while such a possibility yet remained.

The state of Missouri has, in my opinion, an ideal law for the regulation of the practice of medicine and surgery.

Without attempting to quote the law in full, the following Section is given verbatim, as it is the Section under which we operate:

"Section 5. Any person practicing medicine or surgery in this state, and any person attempting to treat the sick or others afflicted with bodily or mental infirmities, and any person representing or advertising himself by any means or through any medium whatsoever, or in any manner whatsoever, so as to indicate that he is authorized to or does practice medicine or surgery in this state, or that he is authorized to do or does treat the sick or others afflicted with bodily or mental infirmities, without a license from the State Board of Health, as provided in this act, or after revocation of such license by the State Board of Health, as provided in this act, shall be deemed guilty of a misdemeanor, and punished by a fine of not less than fifty dollars nor more than five hundred dollars, or by imprisonment in the county jail for a period of not less than thirty days nor more than one year, or by both such fine and imprisonment for each and every offense; and treating each patient shall be regarded as a separate offense. Any person filing or attempting to file as his own a license of another, or a forged affidavit of identification, shall be guilty of a felony, and, upon conviction thereof, shall be subject to such fine and imprisonment as are made and provided by statutes of this state for the crime of forgery in the second degree."

This law was upheld by the Supreme Court of Missouri in a decision by Judge Franklin Ferriss in the October Term of 1910, Justices Kennish and Brown concurring.

Judge Ferriss held that the legislature has the power, under the Constitution, to pass all necessary laws to guard the morals, safety and health of the people, even if such laws in some degree operate as a restraint upon recognized constitutional rights. An absolute right to liberty or property, or even life itself, does not exist. The state may and does deprive its citizens of either of these so-called constitutional rights. Our jails and penitentiaries are filled with people who have been deprived of their liberty for the public good, and that the power of the state to deprive these citizens of their rights for the public good has never been questioned.

A sub-division of the department was created to take over this work consisting of a sanitary officer, who qualified as a private watchman empowering him to make arrests, and a police officer in plain clothes, detailed from the police department. A yearly appropriation of $500 was secured for the incidental expenses of this subdivision; this money being used to pay investigators, who were paid at the rate of $2 per day when working, the payment of fees, carfare and other small expenses found necessary.

The first step in the work was an examination of the city directory and telephone directories, and the careful listing of every person classified as a physician or midwife, as the law requires that all such persons must be registered with the department of health. This list was compared with our register and the names of all persons properly registered were checked off. All of the remaining persons received a letter from the department, stating that they were holding themselves out as being entitled to treat the sick and afflicted, and that no record was on file with the department that they were authorized to do so. They were notified to come in at once and show that they were entitled to practice or to immediately discontinue doing so. It is my recollection that not one of those persons was able to show a right to practice, in spite of the fact that the list was a long one.

This cleared the field of all except those who were willing to take their chances in the further practice of their illegitimate calling.

After the lapse of a little time for the scare to blow over, the department began the real active work of the prosecution of those violating the law.

We found the following conditions were to be met:

First, the established advertising medical company, a permanent institution, generally located in palatial offices in some prominent office building. Most of these companies were financed by laymen, who hired a registered physician, or physicians, who received, examined and outlined the treatment of the patients. They were incorporated under the laws of the state of Missouri and conducted their business in such a manner as to make them immune from ordinary attack. A patient applying was first seen by a physician known as a "case-taker," who make all diagnoses, outlined the treatment and fixed the price. Ordinarily this physician did not see the patient again; the subsequent treatments being generally administered by another, who might or might not be a physician; but even if such subsequent treatments were administered by an unlicensed person there was adequate defense in the claim that the treatment was being administered under direct supervision of the "case-taker," who was always a registered man. The conduct of such a place was undoubtedly based upon competent legal advice.

The objection to such a company was that the main and only object seemed to be relieving the patient of any money that he was able to procure. False diagnoses were made and charges were based upon the wonderful qualifications of the specialist, who as a rule was so incompetent as not to be able to make a living in the practice of his profession in a legitimate way.

A notable instance of this character was the Chamlee Cancer Cure Company, who operated for several years under the name of Dr. and Mrs. S. R. Chamlee. They advertised extensively, claiming to cure cancer without the knife or pain by means of an application made from a South Sea island plant, a discovery of Doctor Chamlee's. The advertisement stated that any lump in a woman's breast was cancer, or that any sore of longer than six months' duration anywhere was cancer. These advertisements immediately flooded this company with inquiries from prospective patients. This concern had a regular system of correspondence for such cases, each person being sent identical letters, which were known as "scare letters" and were numbered 1, 2, 3, etc. The first letter informed the applicant that the case was undoubtedly cancer and urged a personal visit. If this letter failed to bring in the patient a second letter was mailed stronger than the first and these were followed by others, each stronger than the other, until the patient either came in response to them, or it was evident that a personal visit could not be expected, in which event a letter was mailed suggesting home treatment, which while not as satisfactory as personal treatment would undoubtedly cure the cancer. The advertisement guaranteed a cure, but nothing was further from Doctor Chamlee's mind than the giving of such a guarantee. This was evaded in the following manner: Upon examination of the patient the first diagnosis was the financial standing, and was the only necessary one, inasmuch as all cases were pronounced cancerous. A price was fixed a good deal in excess of what the patient was supposed to be able to pay, and upon her statement that she was unable to pay such a fee the amount was reduced, but, of course, with such a reduction he would not be able to furnish a guarantee, assuring the patient, however, that she could depend upon a cure. These fees even when reduced were often as much as $1,000. Should the patient have been underestimated financially, and should she agree to pay the amount first named, an additional examination always revealed other complicating conditions which were made the basis for very much enlarging the fee.

The price having been agreed upon and the money paid (and this was an unfailing rule of the institution that the money was to be paid in advance), the patient was taken alone into a room placed on a chair, anaesthetized, and the lump cut out with a knife, and this without any pretention of asepsis. After the removal of the tissue the site of removal was seared by an application, and a poultice and bandage applied. After this the patient was never allowed to see the site of operation, when the wound was being dressed, and eventually was discharged, at which time she was presented with the excised tissue in alcohol, which was her cancer. Some of these tissues removed were cancerous and some were not. In the first event the cancer recurred, and if Chamlee could not obtain by some excuse an additional fee, the patient was left to her own devices.

The fight against this company was long and full of obstacles, as Chamlee was well able to pay for the best legal talent and to take every advantage allowed by the law. He was attacked from every angle, and being a registered man, his license was revoked, and the licenses of the physicians connected with his institution were also revoked. In this case it was necessary for us to send to California to take depositions, and we never succeeded in making a great deal of progress until we secured the coöperation of one of the physicians who had been associated with Chamlee and who gave us in detail his method. The company was finally disposed of with the assistance of the Post Office Department, who issued a fraud order against it. Without the use of the mails they could not operate.

In the other medical companies we were never able to make satisfactory progress until we secured the assistance of the Post Office Department, who issued them letters of inquiry, outlining the condition of a perfectly normal man, and receiving in return statements that the symptoms given indicated a serious disease and required immediate treatment. Upon the receipt of such a statement the Post Office Department took these cases before the federal Grand Jury and obtained indictments for using the mails to defraud. This rapidly eliminated them.

Secondly, we found the traveling faker, who heralded his arrival with a page advertisement in the newspapers, announcing the opening of his offices where he was prepared to administer some wonderful treatment discovered by him. Among the diseases he successfully treated were tuberculosis, locomotor-ataxia, cancer, etc. If undisturbed he gathered all the money possible and departed for another city where he opened under the same or another name. The department's experience with one will illustrate their methods and the method of the department.

John Austin Larson arrived in the city, opened palatial offices and announced in the press his ability to cure all ills by means of a treatment, discovered by him, which he called the "science of telaconi." He was a chiropractitioner. He opened for business the morning following his advertisement, and his third patient was an officer of this department. He was arrested and locked up charged with holding out as a physician. He gave bond and returned to his office for business, having consulted an attorney who advised charging a consultation fee before seeing the patient. The same afternoon a woman from the department was sent to consult him and came back with the information of the fee required. He was left undisturbed until Sunday afternoon, when the woman again visited him, paid him a fee of $10 and received a treatment. He was arrested, and it being Sunday, he was unable to arrange bond and remained in the police "hold-over" until Monday morning. Twenty additional warrants were asked against him for holding out as a physician through the newspapers, but these warrants were denied until he had been convicted on the original charge. He fought for delay, but was forced to trial, convicted and fined $250 and costs. We then obtained the twenty warrants, and he left town, forfeiting his bond, and has not returned.

The most notable case in our experience of wholesale fraud, in this type of faker, was the establishment of a medical company known an the S. D. Nevling Specialty Company, promoted and financed by one John Weitzman of Chicago and Detroit. This company was also known as "The European Specialists." Nevling was a physician, registered and entitled to practice, who sold himself to the company that they might operate behind his license. This company confined their operations entirely to foreigners, carefully avoiding the English press in their advertisements which they inserted in the papers printed in foreign languages. They also distributed pamphlets in quarters inhabited by foreigners. The translation of these pamphlets is omitted for lack of space, but they were a revelation of ingenious solicitations to the sick. Their offices were very handsomely furnished and equipped with a number of impressive appliances. They advertised for interpreters speaking such languages as French, Italian, Bulgarian, Polish, Roumanian, Greek, etc. These advertisements were answered by men able to speak these languages, and they were engaged as interpreters. Upon reporting for duty they found that they were not only interpreters, but "physicians," although, the day before, their vocations had been waiters, bartenders, etc. They were known by their first names with the title of "doctor" prefixed, such as Doctor Tony, Doctor Walter, Doctor Albert, Doctor Charles, etc. Their compensation and Nevling's compensation was $25 per week, and 5 per cent. of all the money they could get from the patient. At first Nevling received all the patients; but business running smoothly for a while they neglected this precaution, and each of the newly made "doctors" received, examined and treated patients. Upon the arrival of the patient he was taken into a room, required to remove all of his clothing and then was taken into an adjoining room for an examination. During this examination his clothes were searched for the purpose of ascertaining what money he had with him. He was then examined and without fail was found to be in a precarious condition, so serious, in fact, that a few days further delay would have rendered his case hopeless. One of the details of this examination was looking through him with an old camera with a broken shutter. This at that time was their "X-ray" outfit. We accidentally ran across this company in the office of the Circuit Attorney, where one of the victims was relating his story. This man had asthma and was employed in a planing mill. By their examination of his chest with the camera they found "one lung entirely destroyed and the other lung badly in need of cleaning." They proposed to furnish him a new lung and clean the other for the insignificant charge of $500, although $750 was their regular price. They had secured all his money, amounting to some $5 or $6 and had induced him to sign a blank check under the pretense that he was registering. They had found in this man's pocket a bank book showing about $200 as a savings account. Fortunately we were able to stop payment on the check for $200 and save this money for him. Just about this time one of the bartender "doctors" had a falling out with the manager and was assaulted on the street by two or three attaches of the institution. We succeeded in getting hold of this man who was in a frame of mind to give us every assistance, and we learned from him the details of the workings of the office. The offices were raided and everybody locked up. In addition all books and records and everything else not too bulky to be taken away, was removed by the department. With the information we then had in our possession we were in a position to act decisively. All those arrested were charged with practicing medicine without a license, excepting Doctor Nevling. We also secured warrants against all, including Nevling, for obtaining money under false pretenses. John Weitzman, the promoter of this company, attempted to kidnap our bartender "doctor" witness, was arrested for bribery and attempting to entice a witness, which is a felony. These people operated two weeks, had 90 patients and had collected in cash $2,000, which was but 15 per cent. of the fees, the balance of 85 per cent. was to be paid in installments.

The cases of the Chamlee Company and the Nevling Company I have given at some length because they are instructive of the methods pursued by this class of fakers.

The third class of illegal practitioners are those who practice medicine in the regular way, but without a license to do so, and those who claim to cure by some peculiar method or system. They operate without advertising or the distribution of literature, depending for patients upon the recommendation of a patient. In this class is found the man whose license has been revoked; the graduate of a medical college unable to pass the State Board, and those people who practice by fortune telling, witchcraft, etc. A few cases are given illustrative of the methods of those who practice by appealing to the superstition and credulity of the patient:

Mary M. Shedd. Quartered in a fashionable hotel, claiming to cure epilepsy by sound waves from the piano. She placed the patient on one corner of the piano, with the furniture so arranged as to reflect the sound waves through the patient's body, during the playing of soft and soothing music. She was arrested, but escaped owing to defective information. She then left town.

August Pelinsky. Clairvoyant. His treatment consisted of placing a bucket of water and the patient's shoes under the patient's bed. It was necessary to so arrange the patient's shoes that the toes pointed to the north. During the time that the instructions were being given a music box was in operation. His price was $35 for curing any ill. Arrested and discharged by a jury, which is an illustration of what some juries will do.

Khrion. Clairvoyant. Cured by mesmerism. He could tell the name, business, etc., of anybody, which did not prevent him from diagnosing and treating the officers of this department for "nervous wrecks," charging them $2 for the treatment. Arrested and fined $50 and costs.

Susan Lawrence Davis. Quartered in a fashionable hotel. Charged $100 for a course of colon flushing, ten treatments to the course. Arrested and her first trial resulted in a hung jury. She was discharged by a jury at the second trial, in spite of the fact that a perfect case was presented against her. The only reason that we could assign for her release was that she was a good-looking woman. Encouraged by her success she resumed practice, was again arrested and fined $50; she then left town.

Moses Hellscher. Clairvoyant and medium. Cured all ills by making passes with his hands over the patient's head and looking into his eyes, for which he charged $2 a treatment, or $30 for a cure. It developed that the man's name was manufactured by him. He called himself Moses because he posed as a reincarnation of Moses; the last name, Hellscher, is the German name for clairvoyant, or light seer. He received patients and seated them in the front parlor, between which and the back parlor heavy portières were hung; the lights were turned low, and he excused himself to reappear a few minutes afterwards through the portières, arrayed in a brilliant robe, with the exclamation: "Behold Moses the second." Arrested, fined $500 and sentenced to 30 days in jail. He appealed, the case was remanded and he pleaded guilty, getting off with a fine of $50.

Rev. Herman H. Schroeder. An ordained minister. His treatment consisted of giving the patient pleasing literature to read, such as "Puck" and "Judge," which was supposed to put him in a cheerful frame of mind; the Reverend Schroeder then closed his eyes and sat for 15 minutes in meditation. In this way he "cured" deafness and blindness. He charged $2 a treatment. Arrested, but the prosecuting attorney for some reason prostituted his office in the dismissal of this case.

Any number of these cases could be cited, where the treatment was equally ridiculous, if lack of space did not forbid.

From April 1, 1908, to June 1, 1916, the department has accomplished the following results:

Number of investigations made	572
Prosecutions	252
Federal convictions	8
State convictions	149
Cases now pending	2
Fines	$14,692
Sentences:	
To jail	1
To workhouse	5
To penitentiary	2
Revocations of physicians' licenses	32
Revocations of midwives' licenses	3
Revocations of pharmacists' licenses	2

Our investigations of this illegal practice of medicine has developed the fact that a great amount of money has been taken from the sick by these human vultures, who not only rob the unfortunates who come into their hands, but are robbers of the community in which the victim lives, inasmuch as in a great number of cases every cent that the patient has, or could secure, has been taken, and it devolves then upon the taxpayer of his community to provide him with care and attention. Many of these victims mortgage their every possession to raise money to pay these people. It would seem that only the densely ignorant would fall victims to these practices, and yet we found many persons ordinarily considered intelligent receiving treatment.

In the case of the C. O. Wright Tuberculosis Cure (omitted here for lack of space), patients in the last stages of tuberculosis testified to the wonderful benefit they were receiving; many of them living but a short time afterwards, dying of tuberculosis.

The established medical company and the traveling faker, the two worst offenders, cannot operate without newspaper advertisements, and it would seem that the newspapers would not lend themselves to this type of robbers; but up to the time of the conclusion of our successful warfare on these people their advertisements were being continually received by most, if not all, of the newspapers of our city.

THE COUNCIL OF NATIONAL DEFENSE.

DR. FRANKLIN MARTIN,
Member Advisory Commission, Council of National Defense, Washington, D. C.

Address before the State and Provincial Boards of Health, Washington, D. C., May 3, 1917.

I WISH, gentlemen, that I were an orator, that I might adequately express what is in my mind and picture to you the problems we have before us.

The General Medical Board of the Council of National Defense is composed of thirty-nine of the leading medical men in the United States. The members of this Board were invited by the Secretary of War to serve as an advisory committee to my department, and in response to that invitation, these men from all parts of the United States have attended regularly meetings of the Board held on Sunday mornings at eleven o'clock in the offices of the Council of National Defense, Washington.

One of the principal committees acting under the direction of that Board is the Committee on Hygiene and Sanitation, of which Surgeon General Rupert Blue of the United States Public Health Service is chairman. We have before us now the resolutions which were read by the secretary a few moments ago. It will only be a matter of a short time, I am sure, before these resolutions will be recommended by the Council of National Defense and on their way to Congress.

There has been just a little hesitancy on the part of those here in Washington about forcing this matter until we had had the opportunity of a conference such as this, and until we had back of us the resolutions and support of your organization. While the "states' rights" question is an old one, we are constantly running into it. The visit of the governors here today will aid us greatly in coördinating activities of the forty-eight states of the Union with the work of the federal government, and after all, the conduct of the war must be directed by the federal government.

Therefore, Mr. Chairman, to make my statement as brief as possible, I would urge that your resolutions be handed in so that I may present them to the General Medical Board and secure the backing of this strong group of men, and assure them of your desire to coöperate. I am sure that the temper of the committees of the House and Senate is such as to carry these recommendations through. Senator Owen has repeatedly asked that we do this. He is now urging that we hasten matters as much as possible. He has an enormous amount of influence on the conduct of such legislation in Congress.

We are so filled with pride over the actions and developments of the last few days that we can scarcely speak of it, because of the great compliment that has been paid to the medical department of the military forces of this government. Monday evening, at the President's reception, where I had the pleasure of meeting

Mr. Balfour, in the confusion of introductions he heard the word "Doctor." He held me back and asked if I had anything to do with the problem of getting men to Europe, and if there was anything that could be done to aid immediately their medical group in France and England. He stated that the civilian population had been practically deserted and was quite without doctors, as they were all at the front—those who had not been maimed or destroyed during the war.

As the result of my conversation with Mr. Balfour the ranking medical officer of the British Commission requested six Red Cross units, to be turned over to the army in France. Those units will sail within ten days. Each unit numbers 196, 54 doctors and 50 nurses with the enlisted personnel, and they take with them their supplies. On Monday, Colonel Goodwin asked that we send over 200 doctors a month, the first to go within three weeks, and 200 nurses. These doctors are to be sifted into the ranks of medical officers in the British army along the western front. In one month we shall send another 200 doctors and 200 nurses, and every month regularly the same number. They will be of immediate assistance to our allies and at the same time receive their training in military medicine and surgery. In other words, our doctors will be trained in France and England during actual hostilities and in six months, when we send our boys over, these trained men will be attached to our troops. The doctors who go over with such troops as may go, will be trained there also.

That is the program, laid down within an hour after it had been suggested to the Secretary of War. The French have asked for 120 ambulance units. Each ambulance unit has a personnel of 70, 5 doctors being included. We are placing the furnishing of these ambulances in our priority list. We hope to have the ambulances at the time the personnel is ready to go, within three weeks.

There is much to tell, much that is gratifying, but I should like you to take one message home: If the man at the crossroads or in the city medical society says, "Well, how do I know, if I enroll, that I might not be sent to the trenches, or told to do something I am not fitted for, and until I know, I am not going to sign up," for God's sake tell him to either sign up and take his chances or else not to sign up and keep quiet—but not to clog the machinery at the rear.

The Surgeon General's office and our office have letters piled up that we have great difficulty in finding time to answer. They are not of sufficient importance. They are from men in the rear who are asking to be put in places selected by themselves. When they are assured of selected places they will enroll. Men can not be assigned to previously selected positions. The Surgeon General has a form letter that replies to that effect. This is war. We want men. We want them for service, and we want them to serve where they can be of most avail. We have a Surgeon General who has a force of men at his back with all the information they can give him, and he is in a position to decide where a man is best fitted to serve, in a base hospital, a field hospital at the front, or in his medical school at home.

The need is great—almost too great to describe. The most dangerous work in this great war is the work done by the surgeons, the stretcher bearers, and those who are working along the immediate front. The surgeon has his job—the wounded come in, they must be attended to—an 18-inch shell from a distance of fifteen miles is no respecter of persons. He cannot do his work in a trench; he has to do it in a place suitable for that sort of work.

Now France and England have finally asked us to do something. It is so little compared to what we can do, that my advice is (and I am acting on that advice every minute) that we have no "pussy-footing," but fill the requisition immediately.

EXTRACTS FROM DISCUSSION.

DOCTOR RUCKER, *U. S. P. H. S.:* Mr. President and gentlemen. Doctor Martin has placed before us the necessity for the care of the sick and the wounded. I wish to supplement the remarks I made at the Conference the day before yesterday bearing on what we can do in the prevention of illness among our troops.

I think, when all is said and done, we can admit it is a basic fact that the cornerstone upon which the winning of the war depends is health. I think that to us is committed the one absolutely vital and essential thing in the winning of the war. If we can maintain the health of the people in this country in a high degree of efficiency, we can produce the food, the munitions, the arms, the shelter, which our troops need. If we cannot maintain the civil population in a healthy condition, we cannot give to the military forces of the government competent forces of strong, healthy men.

We must realize that in this war there is bound to be an interchange and cross-interchange of infection between the civil and the military bodies, and between the military and the civil bodies. Therefore it behooves us who are in charge of the health agencies in this country to see to it that our work is done with an unusual degree of care and thoroughness.

One of the things which we must do is to insist that the appropriations for health work in the states and municipalities be not reduced. Already some of the states have very unwisely reduced their health appropriations in order to increase their appropriations for defense, losing sight of the fact that the greatest defense this nation can possibly have at this or any other time, particularly in time of war, is the defense of health. Therefore, I think our first duty is to see that the states and municipalities have the money to carry on not only their normal operations, but the added responsibility which comes with war.

The second point I make is this. That is that the governors of the United States, of the various states, are meeting here now. I think it is the duty of every state health officer present here now to go and see his governor and tell him of the resolutions which have been passed and to tell him that you have pledged your state health organization to the government, and that you expect him to back you up absolutely. Then he will go back to his home state, not with his mind filled entirely with strictly combatant matters, but with matters which bear upon both the civilian and the military health of his state. Now, I think that each one of you should make that your bounden duty, to see your governor today and express yourself to him so that he may understand the situation.

[At this juncture the President appointed a committee of three, consisting of Doctors Drake, Hayne, and Rucker to present to the Conference of Governors the resolutions adopted by this body. Later, at the request of Doctor Drake, Doctor Snow was appointed as chairman of the committee, increasing the membership to four.]

DOCTOR RANKIN, *North Carolina:* I would like to get some expression of opinion on this point. As I understand it, there is going to be formed in this country, under a law passed by the Senate and House of Representatives, a Sanitary Reserve Corps. Of course we are all going to apply to the Surgeon General for admission to the Reserve Corps. Now, in addition to that, is it the sense of the members of the Conference that Doctor Martin wishes us and the executive staffs to also apply to the Surgeon General of the Army and sign up for enrollment as medical officers in the Reserve Corps of the army, so that we can be used in either capacity? Is it the understanding that we are to sign up in one group or two? Are we to say, "Use us wherever you choose," or do we restrict our application to sanitary work and not sign up with the army at all?

Doctor Rucker, *U. S. P. H. S.:* In the first place, I believe that a man should not hold two commissions. He should be either a fish or a duck. I don't think he should undertake to swim on top and underneath. I believe this, and I was getting to this when I was very wisely interrupted, that the personnel of the sanitary corps of this country should not be broken up and disrupted. All of us have heard of sanitarians of great ability being set to doing work a fourth-year medical student could do as well in the war abroad, and we should recognize the fact that we are specialists and have a duty to the civilian population which is just as important, if not more so, than any duty we could do in France or England, because after all, they must depend upon our civil population for food and men.

In the second place, let us not forget that this is a scheme for integrating this civil body with the medical bodies, making them available for the military bodies. My idea is this: Let us go ahead and get this Sanitary Corps mobilized, and as we go along it will be possible to make arrangements with the strictly military departments of the government whereby this reserve can be so utilized, and in that way we will be able to carry on our proper duty and at the same time render invaluable service to the military authorities.

I do not wish my remarks to be considered as tending in any way to interfere with anyone desiring to go with the military arms of the government, but I do believe that, so far as we are able, we should endeavor to place ourselves where we can do our best work for the protection of the civil health.

Doctor Tuttle, *Washington:* As I understand it, the U. S. Public Health Service has been made subject to call, at the discretion of the President, for service in either the army or navy, so that I should judge that any person to become a member of the Sanitary Reserve Corps, a part of the U. S. Public Health Service, would in that way also be liable for service either in the army or navy.

Doctor Rucker, *U. S. P. H. S.:* Yes, I should assume so.

Doctor Woodward, *District of Columbia:* I don't like to take issue with Doctor Rucker, but it seems to me that when fighting the battles of this nation, we must have one leader, the President of the United States. I made up my mind some time ago as to what was the proper thing to do, before war was declared, and I did it. I didn't communicate with the Surgeon General of the Army or the Navy; I made no application for a commission in the Officers' Reserve Corps; but I addressed a letter to the Secretary of the Navy and War which told who and what I was, and that I was ready to do any duty whatsoever for which I was deemed by them to be competent, and that if they wanted me in the medical service of the army or navy I would go. If they wanted me in an airship or submarine, I would go. I will follow the President. If they create an Officers' Reserve Corps I shall tender my services to that group, and I am going to leave to the President of the United States and his advisers the determination of the question as to where I am best fitted to work, and when I shall go.

My advice to the men here is to do the same thing—to trust the President. He will not disrupt the sanitary service of the country unless it is necessary for the maintenance of proper military forces. That is my position and I advise others to follow.

THE MENACE OF THE DUSTY TRADES.

W. Gilman Thompson, M. D.,
Professor of Medicine Emeritus in the Cornell University Medical College in New York City.

THE difficulty with the diseases due to the dusty trades consists, in great part, in the insidiousness of their mode of origin, for, with the exception of certain metallic dusts and those of some acids such as chromic and picric, the dusts produce very chronic symptoms of the respiratory tract which differ in no wise from those that may be acquired from other causes. Thus the chronic nasal and bronchial catarrhs, asthma, etc., induced by dust inhalation present no distinctive features, and are as often attributed to that vague process, commonly known as "catching cold" as to their real cause. It is, in fact, astonishing to note how frequently the continuous inhalation of noxious dusts, as, for example, that of cement, is regarded by employer and workman alike, not only as of no importance, but even as being beneficial to health. Further difficulty in assigning to different dusts their proper degree of harmfulness is found in the astonishing toleration which many workmen acquire for dust inhalation, at least in so far as complaint of symptoms is concerned. I have seen a woman who had worked for twenty years in the dustiest room of a paper mill, sorting rags, who declared she never coughed, and I have seen a sandblaster of castings, who had worked for years without acquiring serious symptoms under conditions which I could not personally tolerate for a day. A striking example of this matter is to be found in the case of streetsweepers and ashmen. On passing an uncovered ashcart on a windy day, one usually holds one's nose, or crosses to the opposite side of the street, yet the ashman spends most of the day in a cloud of sharp particles of silica and other components of the ashes. One would suppose that the work would induce frequent bronchial attacks and predispose to tuberculosis, but statistics show that the hazard of respiratory diseases among such workmen is no greater than that from hernia from the strain of lifting heavy barrels or from insolation in summer, and in neither case is it especially serious. A committee on Occupational Diseases with which I am associated, received an interesting report on this subject from physicians officially connected with the New York City Street Cleaning Department. This report showed that among nearly 6,000 sweepers and ashmen examined there were no more cases of incipient tuberculosis (from 1½ to 2 per cent.) than might be found among any large group of workmen. Possibly the outdoor nature of the employment is a counteracting factor. In the New York subways Dr. G. A. Soper has shown that a ton a mile a month of malleable iron is ground off the brakes, and Dr. T. M. Prudden gathered this dust in quantity with a magnet run along the window sills of the cars. In the subway dust Doctor Soper also found cement, silica, stone, cotton and wool fibers, wood, molds and other refuse, 22 per cent. of the dust being organic. It was at first supposed that constant work under such conditions would produce respiratory diseases in excess, but Doctor James Alexander Miller after careful physical examination of a large number of the employees found that "they had no impairment in health because of their occupation," and many motormen gained in weight, or gained what they call "subway fat" because of their sedentary employment. The coal miners of England and Wales present a minimum tuberculosis mortality, although the coal sifters and stokers suffer much from anthracosis.

These examples are cited not in order to minimize the hazards of dusty trades, but to emphasize the difficulty of dealing with the question adequately through legislation, rather than through educational methods. While it may be possible to control a hazardous manufacturing industry through enforcement of laws of hygiene, in many industries the hazard may lie more in the subsequent handling or application of a substance than in its process of manufacture. For example, some of the numerous cement manufacturing plants in California take excellent precautions to preserve the health of their workmen, many of whom are employed continuously for years without exhibiting serious respiratory diseases, but a concrete mixer working independently outdoors may live in a perpetual cloud of dust. I have seen such a workman in Germantown who stood on a platform above a mechanical concrete mixer, emptying the sacks of cement which were brought to him by a continuous procession of fellow workmen. To say that I saw him is almost an exaggeration, so dense was the cloud of dust which enveloped him. It is precisely among such classes of workmen that reliable statistics are lacking, and, with a few exceptions the literature of the occupational diseases which are due to noxious dusts is very meager. It is true that insurance actuaries tell of the relative mortality from tuberculosis among workmen in many of the dusty trades, but reliable data are wanting concerning the incidence in such workmen of cases of rhinitis, bronchitis, asthma, pneumonokoniosis and many other ailments which are more or less incapacitating and certainly not unimportant. For the most part the dusty occupations, exclusive of emery grinding and other machine work, concern unskilled and therefore more or less ignorant workmen. They often change their occupation, either through economic conditions, or because, being incapacitated temporarily by one of the diseases under consideration, they leave their job, and subsequently take up some other employment. This of course adds greatly to the difficulty of tracing cause and effect. The subject is further complicated, in the absence of specific symptoms, in differentiating the factors of influence of home conditions, alcoholism, etc., which may produce the same diseases as those definitely caused by dusts—with the exception of fibroid phthisis.

There are very large groups of workmen employed in deleterious dusty trades, such as plasterers, wreckers of buildings, wood sawyers, cement workers, stone cutters, sand-blast workers, makers of emery wheels, potters, brick and tile makers, workers in grain elevators, workers in horsehair, furs, feathers, leather, workers in lime kilns and charcoal, workers in bone, shell and celluloid, workers in rags and paper, straw and broom, carpet cleaners, etc. And about the health and physical condition of such workmen, little more than general principles can at the present time be stated with any degree of definiteness. We are, therefore, greatly in need of extended health surveys of these industries, such for example as that inaugurated during the past two or three years by Doctor Hayhurst in his admirable work for the state of Ohio, and on a less comprehensive scale in the states of Massachusetts, New Jersey and Illinois. It is altogether premature to advocate controlling legislation for such industries until the actual menace of such hazards has been determined, not merely through cataloguing the number of obviously unhygienic factories or mills or plants, but by comprehensive physical examination of the workmen employed, with due consideration of their home conditions, duration of employment in the particular industries, and all other factors of importance. The American Public Health Association could do no more important work than to urge upon the several States the desirability of such surveys, for without state authority it is difficult to secure the data or meet the expense which exhaustive investigation entails.

Meanwhile, however, there is every reason to push forward an educational campaign through furnishing employers and workmen alike with information regarding the best means of mitigating those hazards of dust inhalation, which are perfectly obvious. Considerations of additional expense to the employer may in very many instances be met by pointing out the economic gain through increased efficiency of maintaining the workmen in good health. The present war will inevitably result for many years to come in a greatly reduced immigration of unskilled laborers for this country, and hence make it more and more difficult to replace workmen who have become incapacitated through the diseases under consideration. It is therefore "good business" to maintain those workmen whom we now have in optimum health.

As regards specific suggestions to employers, we are already in position to offer them without waiting for legislation. The open window is a first principle to be advocated for most factories and mills where dust is a menace, but there are some in which the windows must be kept closed to prevent outside dust from blowing in, as there are others in which they must be kept closed to prevent inside dust from blowing out. An example of the first condition is found where high grade paper and cardboard boxes are being made, which must be kept absolutely clean, and an example of the second exists in factories for working in feathers or gilding with gold or silver foil. In other cases, where the dust is developed close to the workman's face, as in emery grinding, glass cutting, etc., a properly placed exhaust duct is essential and this cannot effectively be operated if windows are open. In some industries, as in working with horsehair or jute, the exhaust duct should be placed beneath the workman's feet, to prevent dust from rising to his face.

The sandblasting of large castings is at best a hazardous trade, but in addition to the workman's helmet he should be protected by a draft of compressed air directed from above and behind, so as to blow the dust away from him towards an exhaust at the opposite end of the cabinet. All lesser castings as well as pottery or porcelain ware requiring "scouring" with the sandblast should be held in a small closed cabinet, the workman's hand passing through a tight-fitting canvas or leather cuff, while he looks in through a small celluloid window. But how often does the employer think that having provided such means of protection, his duty is at an end, and proper maintenance is of no account! In a Bridgeport brass factory, for example, where small brass fittings were being scoured I saw well constructed cabinets, but with the arm openings slit wide open, so that the dust flew out all over the room! Another principle to advocate is the screening off in a large factory room of any of the work which is especially dusty, so that at least only those concerned in the more dangerous work need be exposed, and in many instances such work may be accomplished altogether by machinery, the feeding of the machine being conducted from the outside. I recall another instance of the failure of good intentions. In a paper mill in Massachusetts I saw a large rag sorting room. In the center was a small glass-screened room containing a rotary rag shredding machine—but half the glass windows were broken and dust lay about, both inside and out, several inches deep. The screening of such machines might be made compulsory by legislation, but without provision for frequent inspection, such a law would be worse than useless in giving a false sense of security. How often does this sort of thing occur with our factory ventilation laws, at least in the state of New York! Still another important matter is greatly in need of further study. I refer to the use of oil sprays to keep down dust where the use of water sprays would be impracticable. I found twenty cases of lead poisoning which had developed in the Brooklyn navy yard, several of the victims having come to my clinic. The workmen were common laborers employed in scraping off the red lead paint from inside the double bottoms of warships. They used chisels driven by compressed air. They had been given no instruction as to the hazard, no ventilation and no washing facilities, and the dust they raised was so dense they scarcely could see one another. One of the suggestions for betterment which I offered to the admiral in charge of the yard was that a spray of some form of mineral oil be used to lay the dust. I know nothing of the detail of such matters but the suggestion appeared reasonable.

I do not believe in placing too much reliance upon patent respirators. In some industries they are well enough for temporary use, and it should be made compulsory to wear them, as in going in to empty the "blue beds" of lead carbonate, or to clean out pottery kilns or cement tubes. But for ordinary constant use, as a protection, for instance, in emery grinding, they are most fallacious. The workmen will not wear them for any length of time, and one as often sees the respirator hung around the workman's neck, as one sees his goggles worn over the forehead! Respirators are unbearably hot in warm weather, they soon become clogged, and the workman cannot talk or expectorate his tobacco juice with satisfaction. Women particularly are most reluctant to wear them, perhaps for the former of those reasons! It is far better, whenever possible, to rely upon other means of dust protection, for the workman is notoriously careless in protecting himself.

The more general use of oils to lay dust or floors is to be recommended in certain industries. . In a cardboard box factory where this method was in vogue I was told that sprains had occurred owing to the slipperiness of the floors, but this is a minor objection for it easily is to be guarded against.

A further important matter is the elimination of projecting surfaces and ledges in the construction of factory rooms, which are so often entirely unnecessary, for in fact they frequently appear to have been constructed for the express purpose of collecting dust, and if cleaning be ever attempted, add greatly to the expense.

These elementary principles should be advocated generally and explained to employers as promoting efficiency. The problems of protecting the independent workman who is employed, like the concrete mixer outdoors, or like the plasterer or building wrecker, where protective devices are impracticable, is a much more difficult one. In my experience fully two-thirds of all cases of plumbism have developed among general janitors, especially those occupied in sandpapering dry paint and inhaling the dust of lead, together with sand, emery, etc. It is comparatively easy to protect such men in factories or workshops, but it becomes extremely difficult to do so when they are employed on "outside jobs." In all such cases physical examination by a physician at stated intervals becomes a matter of great importance to detect and give warning of incipient disease, and the same principle should apply to all workers in the especially hazardous dusty trades.

It is encouraging that an increasing number of employers, realizing that the preservation of the workman's health means an economic advantage are taking measures to secure this end, and the American Public Health Association through influence and definitely formulated precept can do a most beneficent educational work.

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PERSONAL HYGIENE AND WAR.

For the present at least, the epidemiological problem of the war, so far as the United States is concerned, is that of the diseases of direct contact. We have already become expert in handling most of the diseases of indirect contact, such as typhoid fever, and in this epidemiological group prophylaxis depends upon the work of expert sanitary officers rather than upon measures taken for the prevention of disease by the individual soldier. On the other hand, the control of the diseases of direct contact depends upon personal hygiene. Whenever large numbers of recruits are brought together in relatively close contact there immediately occurs an extension of those diseases which are spread by droplet infection, a form of direct contact. This explains the rapidity with which mumps, measles, epidemic meningitis, and whooping-cough spread through cantonments.

Leaving out of account the size of the droplets or the propulsive force, it may be roughly stated that the opportunities for the spread of disease by droplet infection are inversely as the square of the distance between the infected and the non-infected. Therefore, the closer individuals are brought into contact the greater is the opportunity for the interchange of infection by droplets. Hence, overcrowding increases the spread of those diseases whose causal organisms enter the body through the respiratory orifices. If the young soldier is trained in the habits of cleanliness, if he covers the mouth and nose in coughing or sneezing, if he is personally careful that he does not spread his infections to his brother soldiers, the respiratory diseases will be less apt to spread. As to those diseases in which the contact is even more intimate; for example, the venereal diseases, here also the answer lies in personal hygiene. Of course, personal hygiene only comes through one route; that is, by education. Education may come through careful teaching or through the lessons bought at the price of experience. Certainly, the former is the preferable method, and it would seem as though at the present time the health authorities of this country should push the propaganda of personal hygiene as never before.

W. C. R.

SOCIAL UNIT PLAN CONSULTS DOCTORS.

Movements to socialize medicine have quite frequently in the past been undertaken without consulting the medical profession. It is reassuring to learn of a new experiment in the socialization of health work which puts into the hands of the physicians themselves the task of working out the methods of the movement. Such is the purpose of the Social Unit Experiment which is now being developed in Cincinnati.

The first feature of the health work which the Social Unit plans to undertake is infant welfare. A station for the mothers of young babies is to be opened in a district in this city under the supervision of the physicians of that district. The staff in charge of the station will be selected by the medical profession of the district and they will be paid at rates agreed upon by the profession as adequate to insure members of the staff against financial loss from this service.

Thus, instead of importing into this territory outside physicians who would contribute their services, and whose clinical experience would be secured in practice on persons who might otherwise have been patients of the local doctors, the medical men of the local community are given the opportunity for clinical work on their own patients, under the direction of a supervisor selected by themselves and with a guarantee of reasonable payment for their work.

A considerable increase in the demand for medical service in the district is expected because of the fact that the Social Unit Plan aims to get in touch with the mother of *every* baby in the district and later to develop other types of medical service to meet the health needs of the community in a complete and thoroughgoing way.

A movement which starts out to improve medico-social conditions with the assumption that the interests of the profession should be protected, and that the advice of the doctors should be secured, is worthy of study and deserving of success. *J. H. L.*

OUR ADVERTISERS AND THEIR ADVERTISEMENTS.

We wish to call the attention of the readers of the AMERICAN JOURNAL OF PUBLIC HEALTH to the advertisements.

To advertisers we speak of the quality of the readers of the JOURNAL. We tell them that among their number are most of the more prominent health officials, national, state and municipal; that these officials purchase large quantities of supplies for their departments.

The average per capita expenditure of the readers of this JOURNAL is probably higher than that of any other journal of the country. Many of the products purchased by them are in the national market. This is rather exceptionally true of the products used by health departments and supplies used in preventive medicine generally.

In view of this fact the readers of this JOURNAL are especially in need of the news about articles advertised.

We now wish to direct your attention to the other side of the question.

Wherever there is any question advertisements offered this JOURNAL are submitted to the editorial board. Our advertisers have quality.

We wish to suggest to our readers that when they want the news about advertised products that they read our advertising columns. When they are in the market for supplies of any kind they should read the advertising columns of this JOURNAL and then give our advertisers the privilege of submitting bids.

If they are in the market for any supplies concerning which they are without the news, we will be glad to submit such news as we can gather for them.

If they will send us news items relating to budgets, intended purchases, or intended buildings or installations, we will be glad not only to publish the items but to put them in touch with sources of supply. *W. A. E.*

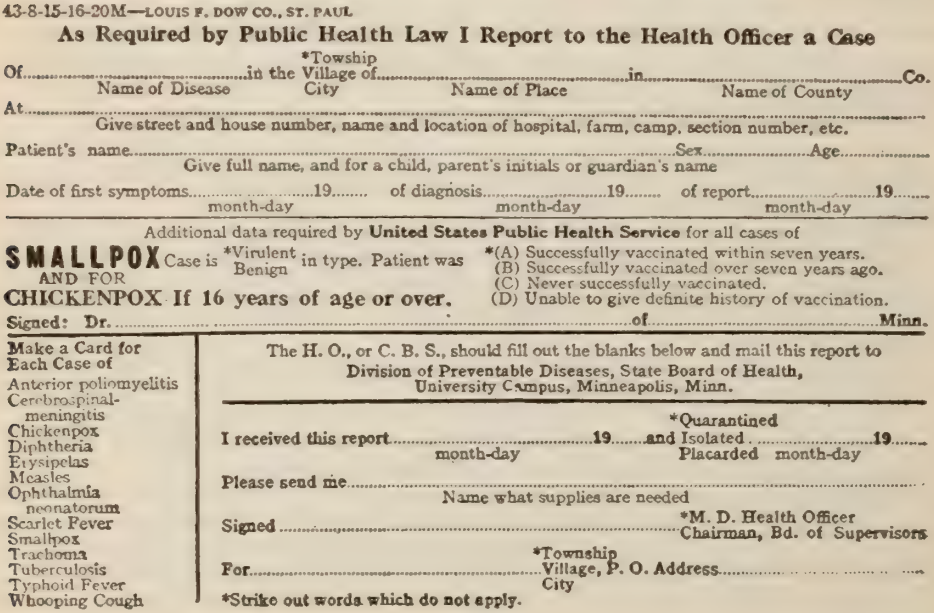
THE USES OF MORBIDITY REPORTS BY THE MINNESOTA STATE DEPARTMENT OF HEALTH.

A. J. Chesley,
Director Division of Preventable Diseases, Minnesota State Board of Health, Minneapolis, Minn.

THE uses to which morbidity reports may be put by a State Health Department depend upon the character of the reports, the time when they reach the department, the incompleteness of reporting throughout the state, and the departmental organization for communicable-disease work.

With few exceptions, the primary notification is made by post-cards or data cards for specimens, written by the attending physician at the patient's bedside.

The regular reporting post-card used for all notifiable diseases (actinomycosis, anthrax, Asiatic cholera, dengue, dysentery, (amebic and bacillary), epidemic or septic sore throat, favus, glanders, hookworm disease, leprosy, malaria, paragonimiasis, paratyphoid fever, pellagra, plague, rabies (human cases and exposed persons) Rocky Mountain spotted or tick fever, tetanus, trichinosis, typhus fever, yellow fever, anterior poliomyelitis, cerebrospinal meningitis, chicken-pox, diphtheria (laryngeal croup; membranous croup), erysipelas, measles, ophthalmia neonatorum, scarlet fever (scarlatina, scarlet rash), smallpox, trachoma, tuberculosis, typhoid fever and whooping-cough) is as follows:



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As Required by Public Health Law I Report to the Health Officer a Case

Of.................................... in the *Towship / Village / City of.................................... in.................................... Co.
Name of Disease — Name of Place — Name of County

At..
Give street and house number, name and location of hospital, farm, camp, section number, etc.

Patient's name.. Sex.................... Age....................
Give full name, and for a child, parent's initials or guardian's name

Date of first symptoms.......................19........ of diagnosis.......................19........ of report.......................19........
month-day — month-day — month-day

Additional data required by **United States Public Health Service** for all cases of

SMALLPOX Case is *Virulent / Benign in type. Patient was
AND FOR
CHICKENPOX If 16 years of age or over.

*(A) Successfully vaccinated within seven years.
(B) Successfully vaccinated over seven years ago.
(C) Never successfully vaccinated.
(D) Unable to give definite history of vaccination.

Signed: Dr. .... of .... **Minn.**

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Anterior poliomyelitis
Cerebrospinal-meningitis
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Diphtheria
Erysipelas
Measles
Ophthalmia neonatorum
Scarlet Fever
Smallpox
Trachoma
Tuberculosis
Typhoid Fever
Whooping Cough

The H. O., or C. B. S., should fill out the blanks below and mail this report to
**Division of Preventable Diseases, State Board of Health,
University Campus, Minneapolis, Minn.**

I received this report.......................19........ and *Quarantined / Isolated / Placarded.......................19........
month-day — month-day

Please send me..
Name what supplies are needed

Signed.. *M. D. Health Officer / Chairman, Bd. of Supervisors

For.................................... *Township / Village / City, P. O. Address....................................

*Strike out words which do not apply.

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The diphtheria data card is as follows:

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University Campus, Minneapolis

Please fill out this blank IN FULL and place around the small can.

Date and hour of taking culture.................... **Is this the first culture?**....................

Patient's name.................................... **Sex**.......... **Age**..........

***Township / Village / City } Residence**.................................... **County**....................
(See other side if a Township Case)

Post Office Address..
(Give street and house number; name and location of hospital, farm, camp, etc.)

Date of first symptoms.................... **Is membrane present?**.................... **Temp**....................

Clinical Diagnosis.................................... **See other side if in a Township**

This culture is ***from a sick person for bacterial diagnosis.**
from a recovered case for release from quarantine.
from a well person merely exposed to infection.

Physician.................................... **Address**....................

Health Officer.................................... **Address**....................

Do you desire a telegraphic report sent collect?.................... **Or culture outfits?**....................

***Strike out words that do not apply.** **(SEE OTHER SIDE)**

The typhoid data card is as follows:

8-1 15 10000

TYPHOID DATA

Division of Preventable Diseases, Minnesota State Board of Health
University Campus, Minneapolis

Date of collection.................................... **This specimen for *diagnosis / vaccination data**

Patient's name.................................... **Sex**.......... **Age**..........

***Township / Village / City } Residence**.................................... **County**....................

Post Office Address..
(Give street and house number; name and location of hospital, farm, camp, etc.)

Special Diagnosis Data:

Date of first symptoms....................

Clinical diagnosis....................

Special Vaccination Data:

Date of { 1st inoculation....................
2nd inoculation....................
3rd inoculation....................

Has patient previously had typhoid fever?.................... **When?**....................

Has patient previously been immunized?.................... **When?**....................

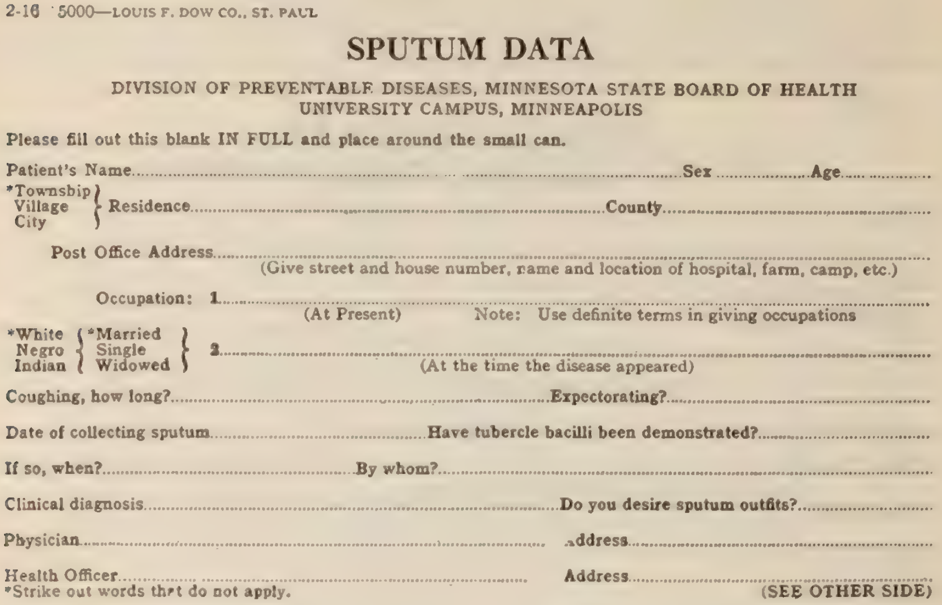
Physician.................................... **Address**....................

Health Officer.................................... **Address**....................

Do you desire a telegraphic report sent collect?.................... **Or Widal outfits?**....................

***Strike out words that do not apply.** **(SEE OTHER SIDE)**

The sputum data card is as follows:



2-16 5000—LOUIS F. DOW CO., ST. PAUL

SPUTUM DATA

DIVISION OF PREVENTABLE DISEASES, MINNESOTA STATE BOARD OF HEALTH
UNIVERSITY CAMPUS, MINNEAPOLIS

Please fill out this blank IN FULL and place around the small can.

Patient's Name.. Sex .... Age..................

*Township / Village / City } Residence.. County..................................

Post Office Address..
(Give street and house number, name and location of hospital, farm, camp, etc.)

Occupation: 1..
(At Present) Note: Use definite terms in giving occupations

*White / Negro / Indian { *Married / Single / Widowed } 2..
(At the time the disease appeared)

Coughing, how long?.. Expectorating?..

Date of collecting sputum.. Have tubercle bacilli been demonstrated?..............................

If so, when?.. By whom?..

Clinical diagnosis.. Do you desire sputum outfits?..............................

Physician.. Address..

Health Officer.. Address..

*Strike out words that do not apply. (SEE OTHER SIDE)

Primary notification for diphtheria is usually by data card accompanying nose and throat cultures for diagnosis. For typhoid fever it is usually the data card with blood specimen for Widal test. This is as it should be, but for tuberculosis too often the primary notification is the data card sent with sputum which shows tubercle bacilli. However, this late report is better than that of the death certificate which frequently is the only report made for tuberculosis cases.

Post-card reports reach the Division of Preventable Diseases, as a rule about twenty-four to seventy-two hours after the diagnosis is made. All cases and suspected cases of notifiable disease must be reported immediately to the local health officer in cities and villages, and to the chairman of the Board of Supervisors in a township, who forward the cards to the division as soon as they copy the data in their registers and carry out the prescribed measures for protection of the public health. Specimen data cards are received the same, or the first or second day after they are written, depending, of course, upon distance from the main or branch laboratory and transportation facilities. In cases not already reported to the local health officer this delay makes little difference, for copies of the laboratory reports on specimens are mailed to attending physicians and local health officers and report is made also by wire if so requested.

Immediate notification by telegram or telephone to the Division of Preventable Diseases is required when a physician is called to a case or a suspected case of actinomycosis, anthrax, Asiatic cholera, dengue, dysentery (amebic or bacillary), epidemic or septic sore throat, favus, glanders, hookworm disease, leprosy, malaria, paragonimiasis, paratyphoid fever, pellagra, plague, rabies (human cases and exposed persons), Rocky Mountain spotted or tick fever, tetanus, trichinosis, typhus fever, or yellow fever, or when a death occurs from any of these diseases. Poliomyelitis was added to this list temporarily by order of the State Board of Health July 11, 1916. Messages relating to this disease are being paid for from a special poliomyelitis fund during the present epidemic. This has enabled the division to keep in very close touch with the poliomyelitis situation throughout Minnesota.

The law states that "all local boards of health and health officers shall make such investigations and reports, and obey such directions concerning communicable diseases, as the state board may require or give," and under this law all sanitary districts can be compelled to report every case in full to the State Board of Health. Minneapolis, St. Paul and Duluth are the only exceptions made at present. These cities make monthly reports and give full information immediately to the division of Preventable Diseases for cases of the diseases reportable by telegram or telephone, and for other diseases when the case evidently was infected outside the city, or persons in another sanitary district have been exposed to infection. This information is used at once by the division in whatever way promises the best results, *i. e.*, personal investigation, reference by letter or telephone to local, state, provincial or federal health authorities concerned, etc.

State institutions are required to report within twenty-four hours after diagnosis direct to the Division of Preventable Diseases, and also to the local health authorities of the district in which the institution is situated. Sanatoria, hospitals, dispensaries, etc., receiving tuberculosis cases must make monthly reports giving full details regarding cases diagnosed in, or admitted to, or discharged from, or who died in the institution during the month.

The Division of Vital Statistics supplies the Division of Preventable Diseases with data from death certificates for notifiable diseases, and each death is checked to determine whether reported as a case. If not so reported, the matter is investigated.

Unofficial reports are derived from correspondence, from newspaper clipping bureau service and from other sources, and are systematically followed up.

The incompleteness of reporting throughout Minnesota is indicated by the fatality rates based on reported cases and deaths.

	Tuberculosis.		Epidemic Cerebrospinal Meningitis.		Smallpox.		Poliomyelitis.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1910	682	2,258	2	20	1,109	7	481	201
1911	731	2,456	0	44	1,439	7	115	58
1912	802	2,286	7	48	2,419	4	35	23
1913	2,516	2,227	18	10	2,864	7	85	30
1914	3,045	2,388	21	35	1,847	7	22	8
1915	3,859	2,280	25	29	1,708	5	123	26

	Diphtheria.			Typhoid Fever.			Scarlet Fever.		
	Cases.	Deaths.	Rate.	Cases.	Deaths.	Rate.	Cases.	Deaths.	Rate.
1910	2,092	566	27.1	1,985	688	34.9	1,095	284	14.9
1911	1,520	335	21.8	938	294	31.3	2,265	190	8.4
1912	904	173	19.1	783	233	29.7	1,827	104	5.7
1913	3,073	215	7.0	1,304	235	18.0	3,487	109	5.0
1914	4,683	354	7.5	1,784	225	12.6	6,655	322	4.8
1915	2,569	200	7.8	994	156	15.6	3,801	144	3.7

Fatal cases reported by death certificate only are not included under "cases." Therefore the fatality rates given are somewhat higher than the actual fatality rates. For example: Fatal cases in 1915 reported only by death certificate numbered 847, distributed as follows:

Tuberculosis	763
Poliomyelitis	21
Cerebrospinal meningitis	11
Typhoid fever	34
Diphtheria	18
Scarlet fever	00

Seventeen of the typhoid cases died in hospitals. Attending physicians excused themselves by saying that they expected hospital authorities to report. Hospital authorities stated they supposed the physician had reported.

Measles and whooping-cough reports are worthless at present. (In 1915: measles, 3,178 cases; whooping-cough, 555 cases reported.)

No disease is fully reported in Minnesota, but considering conditions and circumstances, it is evident that the physicians deserve credit for the improvement these figures show. Undoubtedly the follow-up work has had something to do with the improvement. It was begun late in November, 1912. That year only 8,129 cases of notifiable diseases were reported in the state. In 1913, the first year in which the follow-up system was in operation, the number of reported cases was 19,882 and since 1913 there has been a steady increase in reported cases. Of all fatal cases of tuberculosis in 1914 only 14½ per cent. were reported in any other way than by death certificate, while in 1915 54 per cent. of the fatal cases had been reported previous to death. This was due to better reporting of cases by physicians outside of Minneapolis, St. Paul and Duluth, in districts lacking all the factors which tend to encourage reporting, *e. g.*, dispensaries, visiting nurses, etc.

The character of the reports, the time when they reach the department and the incompleteness of reporting throughout Minnesota have been touched upon. Now the departmental organization for communicable disease work will be briefly mentioned.

The Division of Preventable Diseases includes epidemiology, main and branch laboratories, and the Pasteur Institute. One branch laboratory is in Duluth. The other is in Mankato. The main offices, main laboratories and Pasteur Institute are in one of the buildings on the State University campus, Minneapolis. This makes it possible to file reports from physicians and health officers with the laboratory reports for diphtheria, typhoid fever and tuberculosis. The branch laboratories forward daily not only carbon copies of reports on all laboratory examinations, but also the original data cards received with specimens from cases with clinical diagnosis, "positive" or "suspicious," or laboratory findings, "positive," regardless of clinical diagnosis. It is easy to determine whether or not diphtheria cases, for example, are being released on negative cultures in accordance with the regulations. Laboratory examinations (except for certain institutions) are not made for the cities of Minneapolis and St. Paul, both of which have city health department laboratories, but the main and branch laboratories of the Division of Preventable Diseases serve all other parts of Minnesota. The branch laboratories take part in the follow-up work, but all supplementary reports obtained by the follow-up system are sent directly to the main offices in Minneapolis and are filed with other information relative to the cases. For example, the original post-card report, the data cards sent with blood specimens for Widal test and the epidemiological report, obtained through the follow-up system, are filed in one "open-faced" envelope with the original copies of the laboratory reports on blood specimens or discharges from a case of typhoid fever. In diphtheria, the release-of-quarantine card would be filed in the envelope in addition to the reports of the physician and laboratory. It is no hardship for the branch laboratories to furnish copies of all reports on examinations. Their reports are made in quadruplicate instead of triplicate as in the main laboratory and the extra carbon copy is sent to the main laboratory. Original copies are always retained in the laboratory files. The first carbon copy is sent to the attending physician, the second to the local health officer. Suitable circulars, follow-up letters, etc., are enclosed with the laboratory reports.

It is obvious that the morbidity-record work of the division is very important and that a constant watch must be kept by someone familiar with all phases of communicable-disease problems throughout the state in order to carry out the following special duties of the division:

(a) To record, tabulate and study official reports of communicable diseases within the state, to check the completeness of official returns and to investigate unofficial reports.

(b) To make investigations of the existence, prevalence, source and modes of spread of all these diseases within the state and to report the findings promptly to the executive officer of the State Board of Health. Recommendations for abatement shall be made to the executive officer, either directly or after consultation with other divisions concerned.

(c) To supervise the adequacy of local administrative measures in dealing with the control of preventable diseases, and to report to the executive officer of the State Board of Health whenever the measures being taken by the local authorities are not deemed sufficient.

There is only one full-time local health officer in Minnesota. About twenty-five places employ school nurses. There are no district health officers. County health officers are usually appointed, but they have no jurisdiction in organized sanitary districts, and unorganized territory is wild and unsettled.

The division has two full-time epidemiologists and well-equipped, but undermanned, laboratories.

Whether morbidity reports are used as a basis for field and laboratory investigations, looking to the control of communicable diseases, is indicated by the following:

Between July 15 and September 30, on poliomyelitis work chiefly, the two epidemiologists traveled 18,341 miles by rail and 3,693 miles by team or auto. From January 1 to September 30, 1916, the main laboratory alone made 19,544 examinations, 9,629 being for diphtheria, 7,256 for Widal test, 1,866 for tuberculosis; for diphtheria virulence tests, 149; for typhoid isolation tests, 454. Laboratory examinations frequently determine the diagnosis and they are the basis of control measures in several diseases.

These points relate to the uses of morbidity reports, and have been cited chiefly to show why centralized filing of detailed cases reports received quite promptly after diagnosis is made, and constant study of the reported prevalence of disease, are essential to efficiency in the work of the division.

The routine uses of written reports are as follows: Upon each delivery of mail, the date of receipt is stamped on left border of reporting post-cards, which are filed by diseases in a small box and brought to the director. He examines every report, including primary notifications received with laboratory specimens, and refers, if necessary, to previously reported cases and correspondence and summaries of epidemiological investigations, and, according to circumstances, he may telephone or write to the attending physician or local health officer, or send an epidemiologist to investigate urgent problems.

When cases are reported by telephone, the health officer or physician is advised what to do until an epidemiological investigation can be made.

A report card is made out for each case reported by wire.

In epidemics special uses are made of morbidity reports. During the present poliomyelitis epidemic duplicate files have been kept for convenience, the original reports being used in the routine way, but not taken from their files. Pin maps, showing cases and deaths, have been kept up to date for the state and for the cities of Minneapolis and St. Paul. When a case is "pinned," the upper left corner of the card is cut off. When it has been reported by wire to the United States Public Health Service, the right upper corner is cut off. When it has been entered in the "date-of-onset" file, the lower right corner is cut off. When the epidemiologist's detailed case history is received, this is noted on the duplicate card. The history is typewritten, one carbon copy being returned to the attending physician, another being turned over to the orthopedist who is to follow up the paralyzed cases, and the original typewritten copies are bound in a loose-leaf cover. All investigated cases, with onset on a given date, are listed on 4 x 6 ruled white cards under this date. These cards constitute the "date-of-onset" file. Reports received during the day are written on a wall blackboard in view of a person at the telephone. Every morning the reports of the preceding day are copied on a "date-of-receipt" card and the statement at the top of the blackboard is corrected to show the number of different sanitary districts and counties invaded by poliomyelitis since January 1 and the total number of cases and deaths reported to date. Special statements are also made for cities and counties in which the disease is particularly prevalent.

Quite similar uses are made of morbidity reports sent in daily by epidemiologists or nurses who continue or supplement the work of the epidemiologist in epidemics of typhoid fever, scarlet fever, etc.

Reports required by the United States Public Health Service, aside from the previously mentioned reciprocal notification of cases infected outside of Minnesota, or leaving Minnesota while in an infectious condition, are compiled from the morbidity records and wired or mailed to Washington over the signature of the executive officer who bears the title of Collaborating Epidemiologist to the Service.

The statistical uses of morbidity reports in Minnesota are very simple. Monthly prevalence of notifiable diseases is reported to the auditor of each county on a sheet which has a column for each notifiable disease, and a line for each sanitary district in the county. Entries on these county sheets are made from the reporting cards, the entry being recorded by a blue line under "Co." on each card. A statement showing the prevalence of each notifiable disease in the state is sent with the county and morbidity report to the auditors, and a copy of a neostyle letter relating to public health matters of particular interest at the time.

Another statistical sheet for counties and sanitary districts, showing the number and age of male and female cases reported each month, is prepared from the cards and such entry on the

"Age and Sex" sheets is recorded by a blue line under "Age" and "Sex" on each card. These two forms of statistical records are used in compiling tables for the biennial report of the division, required by law. Smallpox has a special "Age and Vaccination" sheet which provides for classification of cases in the age groups according to vaccination history. Each sanitary district invaded by poliomyelitis, cerebrospinal meningitis, smallpox and typhoid fever has a sheet because the distribution of these cases is reported in detail to the United States Public Health Service. "Age and Sex" sheets for counties are prepared for all diseases but for counties only in diseases not specified here. Diphtheria, scarlet fever and tuberculosis have "Age and Sex" sheets for sanitary districts with a population of one thousand or more. When these statistical entries have been made, the fact is noted on the cards which are filed by disease under county and sanitary district. Reports for cases not terminated are kept in a running file which is checked from day to day. Supplementary information, such as case histories of poliomyelitis and rare diseases, always investigated, are included in the file when received.

When release-of-quarantine report is received, it is placed in the file with the other information relating to the case. The clerk from time to time checks the released cases. In doing this she takes the filing drawer and turns the cards with her left hand, while with her right hand she uses a date-calculating device. The essential parts of the date-calculating device are:

(1) A dial-like calendar on heavy white paper, made by dividing the circumference of a circle 16 inches in diameter, into 365 equal segments, each for a day and into 12 sectors, each for a month. The January sector includes 31 day segments: February sector includes 28 day segments, etc.

(2) A flat, metal "T" shaped arm is made to fit the circumference of the dial and to extend over about 44 day segments. Through the upper part of this arm, four slots are cut, each the size of a day segment. The first slot is at the left end. The others are 21, 28 and 42 segments, respectively, distant from the first. The calendar dial is placed between two discs, the lower of wood, the upper of heavy glass, bound together by a metal rim. A metal post, set in the wooden disc, passes up through a circular hole in the center of the dial and glass disc to act as a pivot for the arm which swings freely over the milled thumbscrew.

Without taking the cards from the drawer, the clerk reads the date of first symptoms and turns the indicator arm until slot 1 shows this date; then (in scarlet fever cases), reads the date shown through slot 21 and refers to the card reporting release of quarantine, which is next to the report card in the filing drawer. If the date of release precedes the date shown through slot 21, the cards are taken out and the case is investigated. If the date of release is later than the date shown through slot 21, the case is checked "O. K."

The release of diphtheria cases in rural districts more than two miles from the nearest city or village, is checked in a similar manner. Slot 28 is then used. The patient is given the benefit of the doubt, it being assumed that early use of antitoxin clears up symptoms within a week or ten days and twenty-eight days after onset is approximately three weeks after disappearance of symptoms, the earliest time for release without negative cultures. Cases released with two successive, separate nose and throat negatives required in cities, villages and rural districts within two miles of same, average thirty-four days from date of onset. A rural case released without negatives is not permitted to attend school or public gatherings until two successive, separate nose and throat negatives have been reported to the local health officer, who then issues a health officer's certificate. Irregularities in the handling of communicable diseases are taken up with local authorities. Such irregularities are not frequent because of the follow-up work, the objects of which are:

(1) To give to health officers, physicians and affected families, information concerning the management and prevention of infectious diseases.

(2) To obtain accurate and complete Morbidity Reports.

(3) To apply to the control and prevention of diseases, the information gained through physicians' and laboratory reports.

(4) To supervise the adequacy of local administrative measures in dealing with the control of preventable diseases.

School nurses report names of sanitary districts from which nonresident pupils attend their schools. Copies of reports from such districts are sent by the division, to the nurses concerned, often enabling them to prevent the introduction of infection into their schools.

In addition to the other records an alphabetical card-index on 4 x 6 ruled white cards is kept for trachoma and tuberculosis cases and typhoid "carriers." The usual identification data are entered on this card and as the patient moves about, or changes occur in the physical condition, or laboratory examinations are made, the information is noted on the cards. In tuberculosis, for example, the patient is followed up as long as he lives in Minnesota. If he leaves the state the proper authorities are notified. This "Tuberculosis Life File" is very useful for field surveys.

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PUBLIC HEALTH NURSES AND CANCER.

A special bulletin, recently published by the American Society for the Control of Cancer, states that nurses, especially those engaged in public health work, can do much to prevent unnecessary deaths from cancer. It is believed that many patients, especially women, will speak to a nurse about the danger signals of this disease, such as lumps, persistent sores, and other irregularities, when they would hesitate to call a doctor. Attention to these apparently trivial conditions often means the actual prevention of cancer or at least its discovery in the early stages when the hope of cure is greatest.

RECENT DEVELOPMENTS IN THE DESIGN OF MUNICIPAL WASTE DISPOSAL PLANTS.

G. R. Tuska, M. S., C. E.,
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Read at Section D-Engineering of the American Association for the Advancement of Science, December, 1916.

SUMMARY.

THE important considerations in the construction of municipal waste disposal plants are discussed and an account given of improved processes for handling of such wastes; more especially as shown in the new plant now being built for the reduction of the garbage of the City of New York. Comparisons are made with older processes, both as regards methods employed and results secured. Objections to former processes and advantages and disadvantages of the new process are discussed both from the sanitary and commercial side.

RECENT DEVELOPMENTS IN THE DESIGN OF "MUNICIPAL WASTE DISPOSAL PLANTS."

The growing public interest in the general recovery of by-products heretofore wasted and in the effort to avoid the destruction of any useful materials has been especially evident in the discussion on the disposal of municipal waste. This interest has naturally been extended not only to the processes and methods used in the disposal of such wastes, but also to the matter of the ownership of such plants —that is whether they are to be municipally or privately operated.

From the standpoint of the public, however, every consideration in the design and construction of such plants should be subordinated to the question of their being built and operated according to the most sanitary methods. The first cost of the plant and its cost of operation should only be considered after the question of sanitation.

The municipal wastes above referred to consist of ashes, rubbish and garbage.

In the matter of the handling of the ashes and rubbish there have been no marked improvements during the last few years. "Filling in" with the ashes and incineration of the rubbish still continue to be the best methods when these materials are handled separately. When they are disposed of in combination with the garbage, high temperature destructors are used. Except in the matter of some of the details of the design and operation of these destructors, there have been no important improvements made during the last few years.

As to the disposal of the garbage of large municipalities two methods in the main are used. First, disposal in the high temperature destructor furnaces referred to above, and second, disposal by reduction processes, in the course of which there are recovered from the garbage, grease and low grade ammoniates, both of which materials are of considerable commercial value. It is in the methods of reduction for the handling of garbage that the greatest inprovements have been made in the last few years. Formerly, where successful reduction processes were used, they were only of two types: one, where the garbage was mechanically dried in hot air furnaces and the grease then extracted by means of a chemical solvent and the material then re-dried so as to produce a commercial product. Second, where the garbage was digested, pressed and mechanically dried, the grease being extracted partly by pressing and partly by degreasing with chemical solvents.

These processes have been in use in all large American cities where reduction of garbage has been followed and in almost every case strong objections have been raised to the operation of such plants on account of the nuisances created. The main objections to these plants have arisen from the gases produced in the destruction of the garbage and from the gases discharged in the drying processes used in these plants.

To obviate these objections a new reduction process has lately been evolved. The operation of this process is as follows:

The raw garbage is placed in a closed tank which is sealed air-tight. This tank or reducer is constructed with jacketed walls and jacketed bottom. Into these jackets the steam, which is used in the reduction of the garbage is delivered, these jackets being so designed that it is impossible under proper operation for the steam to enter the tank or come in contact with the garbage. In the interior of this tank there is an agitating device operated by power from the exterior. When the proper charge of garbage has been placed in the reducer and the covers placed thereon, the tanks are sealed and the solvent is pumped into the reducer and steam admitted to the jacketed walls. The heat from the steam which is transmitted to the garbage through the walls of the reducer causes the evaporation of the solvent and the water in the garbage.

Garbage is usually composed of over seventy-five per cent. by weight of water. The steam heat vaporizes the solvent and the water from the garbage and these mixed vapors are drawn off from the reducer to the condenser. The economy in this method of evaporation rests on the fact that water is vaporized at a lower temperature when evaporated with a solvent having a low boiling point than when evaporated without such a solvent.

The mixed vapors of the solvent and the water while in the condenser are there condensed to a liquid state and the water and solvent together are conveyed to a closed tank. Owing to the solvent being of lighter specific gravity than the water, the solvent and the water are separated by gravity the solvent rising to the top from where it is drawn back to the storage tanks from which it is pumped back to the reducers and used over and over again. The condensed water which has been largely diluted owing to the jet condensers used, is discharged into sewers or waterways.

When the garbage has been thoroughly dried by this method, the solvent is pumped into the reducer and dissolves the grease. The solvent with the grease is drawn off into a closed tank or evaporator where the same is heated by steam pipes, where the steam is kept separated from the grease. The solvent therein is vaporized and carried to a condenser where the same is again liquified and carried to the storage tanks to be used again.

After the grease has been extracted from the garbage in the reducer, the garbage is further dried by means of the steam in the jacketed walls and is now in the form of de-greased garbage tankage which is used for fertilizer purposes after being ground and screened.

It will be seen from the above description of the process that if there are any leakages or vents in any of the tanks or piping where the solvent is handled more or less of the solvent is lost, and thereby a substantial additional expense is imposed upon the operation of the system. It is evident, therefore, that it is to the financial interest of the owner of the plant to see that the same is properly operated.

Furthermore, under this system the garbage is at no time brought in contact with the atmosphere, from the time of its original entrance into the reducer until after over twelve hours of cooking, it is finally discharged therefrom as finished products, dried, sterile and practically odorless. These finished products are grease and the tankage above referred to.

It will be seen from the above description, that the process is one of straight de-hydration and from the time that the material is at the boiling-point, no further chemical action in the material takes place. No process of "digestion" occurs and therefore the odors and gases incidental to such a process are not created. Only the volume of gas contained in the raw material is driven out and only the essential oils of an extremely volatile nature are carried over in the current of steam and solvent vapor evolved. That little or no conversion takes place in the operation is shown by the fact that in the de-hydrated material obtained at the end of the operation, there exists practically the same amount of unconverted starchy bodies as existed in the garbage at the time of its entrance into the reducer.

The water condensed contains all the gases evolved and has when fresh a slight odor of the mixed essential oils. Some traces of alcohol are detected in the effluent and a very small quantity of fixed oils is carried over. Any ammonia evolved, if it has escaped the acid in the garbage, is neutralized by acid carried over in the vapor. Whatever albuminoid ammonia exists in the effluent is carried over by mechanical entrainment as dust particles during steaming out of the solvent.

The effluent from this process consists of almost pure water, this water being the condensed moisture drawn from the reducer while the garbage is being treated and from which the solvent has been extracted as completely as possible. The effluent is cold and gives forth no steam or vapor and is practically odorless, and as a result can have no undesirable effects when run into a large body of water.

The only other possible source of odor during the entire reducing operation would be from the odor contained in the air and gases mechanically included in the green garbage prior to its entrance into the reducer. These gases, plus the air in the reducer itself at the time of filling, are driven out by the first rush of solvent vapor. The entire volume of such gases is so small that no objectionable condition can be created by their discharge.

As regards any odor from the tankage, when this material is taken out from the reducer, it is in a dry condition and quite warm and when it is first exposed to the atmosphere, there is momentarily a slight odor of dried material best described as a smell of stale gingerbread, due to the essential oils rising from the material when hot. No gases are generated and this odor lasts only during the period of emptying of the reducer and is not offensive nor perceptible outside the building.

It will be seen that in the operation of garbage treatment by this process there is no period of gas generation and no large volumes of decomposition and combustion gases given off as in digestion and drying. There is, therefore, no necessity for condensing, washing or trapping odors or gases.

A further improvement has also been made in the solvent employed in the de-greasing process. Heretofore, gasoline has been used for this purpose but it has been proven that a more economical operation and elimination of the danger of explosions is obtained by the use of a kerosene distillate, obtained by the treatment of ordinary kerosene in a vacuum still.

The cost of a plant operating on the above system is from twenty-five to fifty per cent. more expensive than one on the digestor system. The cost of operation per ton of garbage by this system is also considerably higher than by the digestor system; the labor cost being about the same but the cost for fuel and solvent being considerably greater.

As against this increased cost, we have superior sanitary advantages and a considerably greater value of recovered products. By the use of this process a larger grease recovery is obtained, also a more valuable tankage. Where the digestor system is employed, the potash contained in the vegetable fiber, being soluble, is lost in the discharged water. With this process, it remains in the tankage amounting to over one per cent. by weight in the dried product.

Furthermore, with the digestor system the largest portion of the water contained in the garbage is removed by pressing. This water, discharged from the presses, carries eight per cent. of solids by weight and is the most valuable for fertilizer purposes as it contains all the ammonia and potash which is water soluble. All such material is recovered by this process.

Furthermore, with the digestor system where direct heat dryers are used, there results a large loss of solids (tankage, grease and fibrous material), averaging about twenty per cent. of the total weight of tankage fed into the dryer. This loss is due to carbonization of the materials named and results in various odors and gases. This loss with the resultant gases, is avoided by this process.

The practical operation of this system has been demonstrated by the plants handling the garbage for the cities of Los Angeles, California, and New Bedford, Mass., and in the new plant now being constructed for the handling of the garbage of the City of New York this improved process will be employed. The New York City plant will have a capacity of over two thousand tons of garbage per day and will therefore be the largest of its kind in the world. Its construction will be of further interest in view of the fact that every possible improvement in the handling of garbage will be installed so as to enable the disposition of the garbage to be made in the most sanitary manner.

Further improvements have been planned in the transportation of the garbage to the plant. The barges in which the garbage will be transported will be so constructed that all water, drained from the garbage in transit, will be collected in a special closed tank located at one end of the barge. On the arrival of the barge at the plant these tanks will be automatically emptied by attaching a steam connection thereto and by means of the steam pressure blowing the drained water to tanks on shore; the steam also so acting as to disinfect the tanks. While in transit the barges will be covered by specially treated waterproof covers, so attached so as to prevent the discharge of any of the garbage from the barges.

A canvass apron will extend from the barge to the dock to prevent any of the garbage falling in the water during the unloading of the barge. This apron is so designed that it will automatically move with the barge when the same is moved along the bulkhead to bring the various portions of the load under the hoist.

All conveyors in the plant handling raw garbage are of the closed type to minimize the discharge of gases into the atmosphere.

From the above description it is evident that the introduction of this improved process in plants designed for the handling of municipal waste, although more expensive in first cost and cost of operation, insures a thoroughly sanitary disposal of such wastes, obviates nuisances and obtains a maximum recovery of commercial products.

DIAGNOSTIC LABORATORIES IN PUBLIC HEALTH WORK.

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IT IS not the purpose of this paper to discuss what chemistry and bacteriology, and chemical and bacteriological laboratories have done for the public health movement, nor to review the work that is being done by state public health laboratories. The diagnostic or so-called public health laboratory, occupies the same important place in the proper administrating of public health services as it does in the scientific practice of medicine. This is a conceded point and needs no discussion. The chief concern of state laboratories should be to keep their field of operation from becoming narrow and constricted.

As a rule there is but one state laboratory, located usually in the capital city, to supply service to all the physicians, veterinarians and health officers in the state. This laboratory is far removed from a large percentage of the physicians. The physician, for instance, who is located 100 or 200 miles away, can, with only the greatest inconvenience, use the laboratory, and even then it is not a diagnostic laboratory in the sense in which he thinks of diagnosis. It is purely a health laboratory. He is looking for the laboratory which can be of service to him in reference to the patient, one which will give him aid in making an early diagnosis, and therefore be a guide as to the treatment of the case. If it takes, for instance, twenty-four hours for a specimen to reach the laboratory, and if it takes several hours more for the culture to incubate, there are many cases in which a diagnosis must be made before the laboratory report is received, even though it be telegraphed.

This is well illustrated in the case of diphtheria. Under these conditions the laboratory is not a diagnostic laboratory in the sense that is understood by the average physician, but is purely a public health laboratory, the only benefit accruing being that to the public in that by keeping the patient isolated until negative cultures can be obtained, the community is protected.

This, of course, is worthy enough, and is the service which state laboratories have been supplying. But has not the time come—the physicians are realizing the importance of the laboratory as an aid in their practice, and the communities are realizing its importance as an aid in the early diagnosis of disease—for extending the scope of the state laboratory work? How this can be done I propose to discuss hereafter.

In the eight counties lying immediately adjacent to the one in which our laboratory is located, there are 443 physicians practicing medicine. Of this number 231 or 50 per cent. have made use of the laboratory in the last six months. In the outlying counties, that is those which are not within such easy reach of the laboratory, there are 1,838 physicians, 732 or only 39 per cent. of whom have used the laboratory in the same length of time.

From the eight counties which are situated close to the laboratory, we received in the last six months 1,475 or 24 per cent. of all the specimens received during that time. The population of these counties represents only 16 per cent. of the total population of the state, excluding Milwaukee which has its own laboratory.

It further appears from these records that from 10 per cent. of the physicians in the state we received 24 per cent. of the total number of specimens received in the last six months. This is not from any lack of interest on the part of the other physicians, I believe, but because many of them are too far away to be able to make the laboratory of real service.

Distance and inconvenience are not the only disadvantages. The limited variety of examinations or tests which can be made is a serious fault. The detection of a typhoid carrier is seriously interfered with when it is necessary to ship the material over a distance which requires a twenty-four hour delay, and sometimes longer, in making the examination.

In some states tissue diagnosis is done as part of the laboratory work; in some there is a charge made, and in some it is not done at all. It is my opinion that this belongs as much to the work of a public health laboratory service as does the examination of sputum. It is further my opinion that there should be laboratories operated for public health purposes, required to do all work pertaining to the laboratory diagnosis of disease. This cannot be done in state laboratories as they are now being run in many states.

There are some states, I am aware, where the so-called public health laboratory or the board of health laboratory, has established branches. That is to say, states wherein the main or central laboratory is aided in its work by two or more branch laboratories located in that part of the state which is most in need of the service. This is well enough if nothing better can be done. It is superior to having only one laboratory.

Under existing conditions in many states, it is probably impossible to develop what has been suggested above, namely, clinical diagnostic as well as ordinary board of health laboratories. It certainly cannot be done where only one laboratory is maintained, nor can it be done completely by establishing branch laboratories wholly supported by the state unless the state has more money for this purpose than the most of them have, and even so I am of the opinion that that is not the way it should be done.

It appears that such a scheme can be accomplished economically and at the same time so distribute the expense that the greater part of it will fall upon those who get the greatest benefit, by a plan of state and municipal coöperation, the city bearing the greater part of the expense. The state should put in enough money to pay for the work which is done for the physicians and others, who live in the outlying adjacent districts, and the city should supply the rest. The laboratory should be required to do all examinations and render all laboratory service requested and required in medical work both for physicians in the city and those outside. When it is feasible, it is to be desired that the laboratory be established in connection with a hospital thereby raising the standard of the institution and giving the patients the benefits which would accrue from having a good laboratory convenient for the physician. The director in such a case would also be the hospital pathologist.

At least two such laboratories can be aided by the state for the amount that it takes to establish and operate one which is wholly supported by it, and too, a large number of cities which, on account of their size, are unable to wholly support a good laboratory, can take advantage of such a scheme to secure one.

The state central laboratory should be maintained solely for the purpose of research, and the director should have supervisory control of the state coöperative laboratories.

Such is the scheme now being put into operation by the State Board of Health of Wisconsin. They have already established two coöperative laboratories and have applications for others.

There are many advantages in having such a system of laboratories:

The aid of a laboratory is brought in easy reach of every physician in the state, rural and city, and can therefore be used as an aid in his practice.

The influence in the community for good in the way of proper thinking about disease and infection will be greater, and a great deal will be accomplished to overcome the feeling of antagonism for laboratory and public health work in those places where the proper interpretation has not been made of laboratory diagnoses, and where only one physician in a town can afford a laboratory assistant. In the latter case it often happens that through jealousy and a fear of their competitor, many of the physicians will not accept or acknowledge the value of laboratory diagnosis.

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WASSERMANN TESTS.

In the *New York Medical Journal* for June 30, 1917, Dr. R. C. Rosenberger says that during 1916, 5,106 Wassermann tests were made at the Philadelphia General Hospital. Of these, 4,430 were performed with blood serum, and 676 with the spinal fluid. Three antigens were used, namely, an alcoholic extract of syphilitic liver, an acetone insoluble lipoid and a cholesterinated alcoholic extract of beef heart. Of the bloods, 27.4 per cent. were positive and of the spinal fluids 22.2 per cent. gave positive results. The cholesterinated antigen was found to be by far the most sensitive. Using a reliable antigen, the Wassermann test is the most valuable aid in the diagnosis of syphilis.

A CHECK FOR THE REGISTRATION OF BIRTHS.

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Read before the Section on Vital Statistics of the American Public Health Association, Cincinnati, Ohio, October 24, 1916.

GIVEN a good registration law and able registration officials, the problem of more complete registration of births then resolves itself into finding a satisfactory checking system.

How are registration officials to learn of unreported births? Many partial checks have been devised, such as comparing, with the official birth records, the baptismal records of the clergy, the death certificates of infants and young children, (1) the admissions to hospitals for infants, the lists of babies entered in baby shows, (2) the lists of births obtained by members of women's clubs, (3) the lists of births obtained from those who sell "baby carriages, cribs and high chairs," the birth notification cards voluntarily sent in by insurance agents, the birth notices in newspapers, and later on, the names of children who apply for copies of their birth records to enable them to enter school or go to work. All of these comparisons have value, each one permits a partial check, and each one, in a state where birth registration is poor, doubtless will bring to light many unreported births.

A special canvasser has discovered annually in Boston hundreds of such births. (4) "A state inspector is constantly employed in Pennsylvania and has been instrumental in securing many thousands of births."

Attempts have also been made to ferret out births by sending beautiful birth certificates, suitable for framing, to every known mother, hoping that mothers, who did not receive such certificates, would apply for them. A similar attempt was tried recently in New York City, for a New York newspaper account read—"One of the special features of baby week will be the presentation to each baby born during the week of a certificate signed by Mayor Mitchel and Health Commissioner Emerson, with a copy of the seal of the City of New York." In some places, as a special inducement, physicians have been paid twenty-five cents for each birth reported, though the wisdom of such a plan has been questioned. Doctor Trask says, (3) "This custom is likely to create in the minds of many the idea that the registration is a matter of discretion, that if the fee is not wanted there is no compulsion to file the certificate and that the forfeiting of the fee annuls the obligation." Finally, (7) complete lists of births have been published in the daily newspapers in the hope that omissions would be noticed. But just as a large number of remedies for any disease indicates that no real cure has yet been found, so the very number of these methods and checks for disclosing unreported births indicates that no really satisfactory method has yet been devised.

However, there is one method, mentioned above, which I believe is capable of such elaboration that it can be made really effective. I refer to complete lists of births in the daily papers. The chief objection to this method in the past has been that it furnished addresses, which were used by (5) credit furniture dealers, druggists and makers of patent foods to pester families with (6) samples and advertisements. But this objection can be readily overcome. To illustrate the proposed elaboration, a notice and a list of births are here given as they would be published in a newspaper of May 15, 1917:

REWARD OFFERED

for notification of any unreported 1917 birth, which occurred in the city before May 3. A birth which has not appeared in this column has not been reported. If you know of any such birth, report it at once to the City Registrar and receive a reward of twenty-five cents and a button.

The dates of births are given below followed by street addresses, in alphabetical order. For the last figure of an address number a dash is substituted. The word (Reward) following an address means that a reward has been paid.

DATE AND PLACE OF BIRTH.

April 6 – Chestnut St. (Reward)
May 1 1– Arlington St.
43– Brown St. (Reward)
May 2 34– Adams St.
156– Harvard Ave.
8– James St.
32– Wellington Park.

This list shows that the birth on Chestnut St. occurred at some number from 1 to 9, the birth on Arlington St. at some number from 10 to 19, the birth on Brown St. at some number from 430 to 439, and so on. For the next day's paper, May 16, 1917, the heading would be the same, except that the reward would be for notification of unreported births which occurred before May 4. No names of children or parents should be given. The word (Reward) shows to the public that the doctor did not report the birth at that address, while the fact that the word (Reward) does not appear in the above list after the second address, 1– Arlington St., shows that the delinquent doctor reported the birth before the neighbors did.

Under such a plan parents would watch the newspapers for the birth report of their child, and bright boys and girls as well as adults in the neighborhood would watch for any omissions in the daily list. Inasmuch as this is a button age for school children, a button could be given as an additional inducement. Buttons could be made with simple designs like the following:

1917	1917	1917
Boston	Boston	Boston
Births	Births	Births
1	2	3

A button of the first design could be given to any person who finds an unreported birth; if later this individual discovers a second birth, the first button could be exchanged for one having a figure 2, and so on, the figure on the button always indicating how many births the wearer has discovered. This plan would furnish a big corps of registration officials throughout the city. Public health nurses, dispensary nurses and policemen could be required to examine these lists daily for any omissions in their districts. The cost would be small. People would dislike to have the births of their children reported late. Physicians would dislike to have their carelessness thus published to the community. The substitution of a dash for the last figure of a street number would prevent use of the list by advertisers and yet would permit neighbors to check the births. In a locality composed of tenement houses containing several families at each street number, no harm would result if complete numbers were published.

(7) One city has used newspaper lists of births giving the names of parents but not the addresses; but this plan permits advertisers to look up the addresses in the directory, and furthermore, does not permit such a complete check, as would a list by streets, for those having common surnames like Smith and Jones or uncommon foreign names.

The Model Law has proved such a great success that it probably will be changed but little, when the subject of revision is considered in 1919. However, a requirement that notification of a birth be sent within forty-eight hours to the local registrar, would be a decided improvement. It would permit public health nurses to visit the babies earlier, and it would permit the newspaper lists to be made up from the notification cards, so that a paper dated May 15, could publish births which occurred as recently as May 10, thus ensuring a more accurate check by the neighbors, for a baby is a bit of news for the first few days.

The net result of this reward and button scheme should be a most efficient check upon birth registration, a check not only for the use of the local registrar, but one equally as good for the state registrar, the Bureau of the Census, or the public generally, for the working of the registration law in any place would become at once an open book for anyone who read the newspapers. If a great many rewards were given, people would ask why more physicians were not prosecuted. On the other hand, if few births were reported after the legal limit, the people could congratulate themselves upon the efficiency of their registration laws and officials.

REFERENCES.

(1) Report of Committee on Birth Registration. Trans. Am. Ass'n Study and Prevent. Inf. Mortality, 1911, p. 58.

(2) Mr. Lewis Meriam. Trans. Am. Ass'n Study and Prevent. Inf. Mortality, 1913, p. 311.

(3) Vital Statistics. Dr. John W. Trask, Assistant Surgeon-General U. S. Pub. H. Service, p. 25, and p. 22.

(4) Dr. Cressy L. Wilbur. Preventive Medicine by Dr. M. J. Rosenau, p. 881.

(5) Dr. C. E. Ford. Trans. Am. Ass'n Study and Prevent. Inf. Mortality, 1913, p. 307.

(6) Dr. L. Emmett Holt. Trans. Am. Ass'n Study and Prevent. Inf. Mortality, 1913, p. 310.

(7) Dr. William C. Woodward. Trans. Am. Ass'n Study and Prevent. Inf. Mortality, 1913, p. 318.

VISCERAL CHANGES IN WOOD ALCOHOL POISONING BY INHALATION.

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Read before the Annual Meeting of the American Public Health Association, Section of Industrial Hygiene, Cincinnati, Ohio, October 27, 1916.

Part I. Theoretical.

1. *Introductory.*

VERY few investigations have been made of harmful effects of inhalation of methyl alcohol—I am referring to the work of Eulenberg (1), Poincaré (2), Tyson and Schoenberg (3), and Loewy and Heide (4) and Mueller (5). Of these only Poincaré and Tyson and Schoenberg have studied the histo-pathological changes. But these results, although not numerous, leave no room for doubt as to the extremely dangerous effects of inhalation of wood alcohol. To quote Tyson and Schoenberg: "There exists a striking similarity between the effects of ingestion and the inhalation of wood alcohol."

The work of Loewy and Heide is of very great importance and interest as they were the first investigators to study the question of the relation of concentration of methyl alcohol in the air to its absorption.

2. *Pharmacological and Chemical Data.*

In comparing the effects of ethyl alcohol with those of methyl alcohol one is confronted with the fact that a single dose of the former is more poisonous than the same dose of the latter.

As pointed out by Harnack (6), Fuehner (7) and others, the intensity of action (*Wirkungsintensitaet*) of equimolecular solutions increases with the increase of the number of atoms of carbon, as well as with the greater solvency for lipoid substances (Meyer Overton), and inversely as the surface tension of the solutions. (When, however, the number of carbon atoms reaches 7, *i. e.*, after heptyl alcohol is reached, these laws are no longer true since the higher alcohols, such for example as cetyl alcohol, are almost solid, insoluble in water and are as a rule non-absorbable.)

These investigators claim that ethyl alcohol, *i. e.*, its action, is from two to four times as strong as that of methyl alcohol in single doses,—for example, codeine (a methyl preparation of morphine) is much weaker than dionine (an ethyl preparation of the same alkaloid).

But Pohl (8) observed experimentally that while no bad effects followed immediately after the administration to an animal of a small dose of methyl alcohol, very serious results were noticeable a few days later, the experiment in many instances terminating fatally. If a small non-lethal dose be repeated a few times fatal issue occurs invariably, while ethyl alcohol, similarly administered, produces no such effects.

How are we to explain such paradoxical phenomenon? Why does a substance, non-lethal in a single dose, become lethal after a few repeated doses, and *vice versa?* The explanation as given by Pohl is as follows: Ethyl alcohol is very rapidly oxidized in the animal body, in fact so rapidly that over 90 per cent. of it is converted to carbon dioxide and water, whereas methyl alcohol is oxidized very slowly, with the formation of formaldehyde and then formic acid.

It is formic acid and its cumulative action that is responsible for the untoward effects of methyl alcohol, the variability of individual results depending on the individual power of oxidation, the action of wood alcohol thus becoming especially dangerous in those who are ill nourished.

Placet (9) constructed the following table showing the difference in the elimination—that is, the rate of elimination of the two substances.

In other words, the complete elimination of wood alcohol requires five times as much time as that of ethyl alcohol, and we are dealing here with a cumulative action.

In rabbits the elimination of wood alcohol while faster than in dogs is

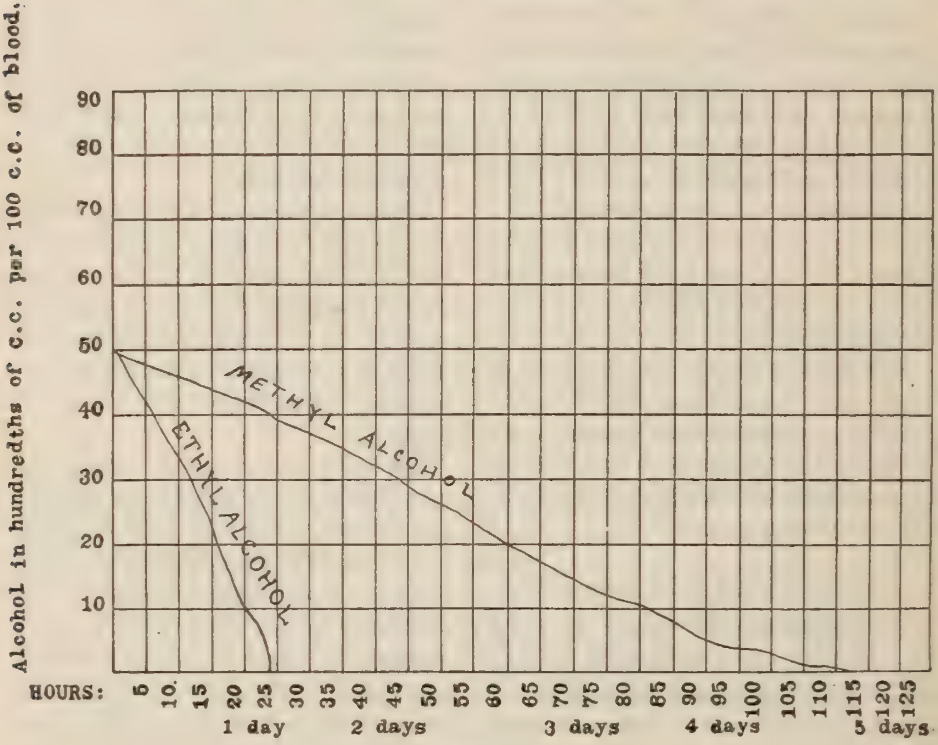

CHART 1.

The curves of elimination of ethyl and methyl alcohol after ingestion of 5 cc. of alcohol per kiloweight, in the form of a 10 per. cent solution. (Dog.)

three times as slow as that of ethyl alcohol. Because of the relatively more rapid elimination of wood alcohol in rabbits than in dogs I have chosen the former for my experiments since the results obtained with them will be at least as significant as those obtained with any other animals and I shall be spared a possible reproach for having used the animals in which the elimination was the slowest, and, *pari passu*, the pathological changes the greatest.

The histo-chemical investigations of Placet (9) show that the power of fixing methyl alcohol varies with the different tissues, the following organs being given in the order of their affinity: brain, liver, kidney and muscles. This statement of Placet finds abundant confirmation in the results of my experiments.

Possessing a marked affinity for certain tissues, methyl alcohol very slowly undergoes oxidation to formic acid which, as we know, has to be neutralized in one of two ways: either by protein-split ammonia if the animal has some stored protein for this purpose, such neutralization eventually leading to protein starvation, or by the alkalies of the blood (and this happens invariably when there is no ammonia), such neutralization leading to acidosis. These are the systemic effects, in addition to such well-known local manifestations of intoxication as optic neuritis, etc.

As to the various circumstances governing the inhalation and absorption of methyl alcohol, the questions which naturally suggest themselves are: What relations exist between the concentration of wood alcohol in the air and quantities which are inhaled into the lungs? How much time is necessary for the saturation of the body with it? For the production of harmful effects? What is the maximum quantity of wood alcohol inhaled which is still compatible with life?

Wood alcohol is very readily absorbed into the body from the pulmonary surface. Loewy and Heide have shown that inhaling the air in which wood alcohol is present in so slight concentration as 0.2 per cent. for two to eight hours leads to its accumulation in the animal body in the quantities varying from 0.32 to 0.55 grams per kiloweight, which means that if a person weighing 60 kilograms (about 150 lbs.) inhales the air in which wood alcohol is present in the proportion of 0.2 per cent for 8 hours, at the end of this period there will accumulate in this body about 25 grams of wood alcohol, which is a considerable amount bearing in mind the extremely slow oxidation of this substance. (See Chart 1.)

As to the rate of absorption, this depends entirely on that of diffusion, which is of course most rapid at the beginning of inhalation when the difference in the partial pressure of methyl alcohol in the air and that in the pulmonary blood is the greatest. When (and this happens very soon because of the slow elimination of wood alcohol) this difference is equalized, the rate of absorption will depend solely on the rapidity of elimination of wood alcohol by the animal body. In other words, absorption of wood alcohol is most rapid at first, quickly becoming slower and slower until it becomes entirely dependent on the elimination.

PART II. EXPERIMENTAL.

Twelve rabbits, with controls, were used, one half of the animals being subjected to inhalation of Columbian Spirits, and the other to that of commercial wood alcohol (both brands were purchased from Eimer and Amend, New York).

It was of utmost importance to create atmospheric conditions as similar to those which prevail in ordinary workshops as possible, and with that purpose in mind a wooden box was built according to the specifications evolved by Tyson and Schoenberg, with suitable openings and mica valves, sufficient draught being allowed to insure a very fair ventilation, the temperature being about 68 F. throughout the entire length of the experiment, with hygrometric readings being invariably about 60 per cent.

The animals were very carefully looked after, and were placed under the best hygienic and sanitary conditions (thus having a decided advantage over the great majority of workers).

Both wood alcohol and Columbian Spirits were administered as follows: A piece of cotton large enough to soak up 1 ounce of either substance was suspended from a hook in the ceiling of the cage for periods of time varying from 15 minutes to one hour, three times.

In no case was it necessary to increase either the amount of the substances used or the frequency and the duration of exposure to inhalation. In fact, the first three animals died within 6–10 days after 15 minutes' exposure, three times a day, with one ounce having been used, when it became necessary to decrease the quantity of wood alcohol and Columbian Spirits to one-half of an ounce.

The animals—except those three which died within 10 days after the experiment had been begun, were permitted to live 2 months, 4 months, 6 months, 8 and 10 months, respectively.

The most striking observation was the uniformity of lesions (practically in every case the same organs, and those only, were involved), the extent of lesions varying with the duration of time exposure, thus the fatty degeneration of the cardiac muscle or destruction of the perenchyma cells of the cerebrum being more extensive in the rabbit which had been exposed for 6 months than in the one which had inhaled wood alcohol or Columbian Spirits for but 2 months.

Another interesting observation was the fact that neither macroscopically nor microscopically could there be detected the slightest difference between the effects of the "ordinary" commercial wood alcohol and those of "refined" or Columbian Spirits—in fact, should one be disposed to do so, he could properly maintain that the latter is, if anything, a more violent acting poison than the former, since the two most severe cases of destruction of the cerebral parenchyma were observed in the cases of inhalation of Columbian Spirits.

Of course, one might expect *a priori* that there would be no difference, since mere masking of the odor and possible removal of certain impurities can in no way be expected to prevent or mitigate the physiological action of formic acid—the true *modus operandi* in the cases of poisoning by wood alcohol.

On what some of the manufacturers base their claims that the "refined" product is "quite harmless" is rather uncertain, I should think, unless they are of a very trustful disposition. One might as well try to "deodorize" and "refine" bromine and proclaim it, *eo ipso*, "quite innocuous."

Because of the striking uniformity of lesions it is unnecessary to go into each protocol or description of histological picture separately, a general discussion being sufficient, providing one bears in mind that the extent of the various lesions is directly in proportion to the length of exposure.

As noticed in the theoretical part of this study (Placet, Loewy and others), the central nervous system—notably the cerebrum—appears to bear the brunt of the attack, it being together with the optic nerve the most frequently as well as the most extensively involved organ. Next in frequency, but not necessarily in extent, of involvement are the kidneys, the liver, and the muscle—the latter again showing a very marked inequality of involvement, the cardiac muscle being affected in every case while the striated and the smooth muscle were involved but in 10 per cent. of the cases.

This limitation of lesions to the above organs brings us face to face with another deduction, namely that in so far as distribution of the lesions is concerned (and it will presently be shown that this applies to the nature of lesions as well), there appears to be no difference between the effects of wood alcohol when imbibed and when inhaled.

The lesions found in the various parts of the cerebrum, the cerebellum, the medulla and the pons consisted of different degrees of inflammatory and degenerative processes. Macroscopically the tissues appear yellowish, glistening; the line of demarcation between the gray and the white matter is not as sharp as in the control animals, in the more prolonged cases the gray matter appearing quite thinned—the entire picture being one of a non-specific atrophy.

Microscopically, the neurocytes are diminished, assuming a spindle-like shape. Nissl's granules also are diminished, with brownish pigment scattered here and there.

In the more severe cases the parenchyma cells are greatly reduced in numbers as well as in size. Thus, for example, the brain of the rabbit which had been exposed to the inhalation of Columbian Spirits showed practically nothing but neuroglia cells and no trace of parenchyma cells, the latter being represented by masses of granular debris and fat droplets, partly taken up by the so-called contractile cells, *i. e.* leucocytes, lymphocytes, and according to Birch-Hirschfield, endothelial cells.

The different stages of parenchymatous degeneration depend, of course, on the length of the exposure to which the animal has been subjected, the nuclear changes varying from the wandering of the nucleus to the periphery of the cell to the total karyolysis.

My impression is that the apparent increase of the connective tissue is due not only to the fact that the parenchyma cells have disappeared, but to the actual proliferation of the fixed tissue cells, as seen by the very marked thickening of the adventitia and the media of the blood-vessels.

The entire microscopical picture corresponds very closely to Adami's "exhaustion" condition,* which is "anatomically recognized by the disappearance of cells and fibres and the secondary overgrowth of glial tissue filling in the space."

The lesions of the liver and the kidney present, both macroscopically and microscopically, the typical characteristics of albuminous degeneration (cloudy swelling) and fatty degeneration—the increased size of the organ, softened consistence, the tissue being almost friable (*etat crible*), glistening yellowish color, the protoplasm being uniformly dull-gray, the outline of the cells in most cases being altered or lost. The nuclei are much smaller than they normally are, lost in many cases, and appearing as vague, shadowy structures in others. The cell bodies are filled with granular, dust-like masses.

In cases of long standing, in addition to the above general appearance there is also a marked increase of the connective tissue, especially around the blood-vessels.

The muscle cells, especially the heart, present an appearance very similar to that of the liver and the kidney, as well as both fragmentation and segmentation, in some of the cases.

The lung shows in many cases patches of broncho-pneumonia, which, however, are not uniform, either in distribution or in extent.

PART III. CONCLUSIONS.

1. Wood (methyl) alcohol when administered by inhalation is as dangerous as if absorbed by ingestion.

2. The effects as revealed by the study of lesions depend primarily upon the concentration (which in its turn depends upon the ventilation), and the length and the frequency of exposure.

3. No appreciable difference has been noticed between the effects of the ordinary commercial wood alcohol and those of the so-called Columbian Spirits.

4. The results of the study are all the more significant because the animals used in connection with it (rabbits) probably are more resistant than any other to the effects of wood alcohol, owing to the rapid oxidation of the poison.

5. As in ingestion, so also in inhalation the real cause of the toxic effects of wood alcohol lies not in the toxicity of wood alcohol *per se*, but in its slow oxidation to formic acid which is very poisonous, acting as it does both as an acid and, during oxidation, as an aldehyde.

6. The danger to workers in industries in which they are exposed to the inhalation of wood alcohol—no matter in what form—may be partially, and only partially, obviated by

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* Adami and Nicholls, The Principles of Pathology, 1911, Vol. II, p. 526.

a most thorough ventilation; the most important consideration being allowed for each worker much more space than is usually alloted, in order to diminish the concentration of the vapor of wood alcohol.

7. The workers should be warned of the danger of the exposure.

8. Perfect health, *i. e.* perfect oxidation processes, is the best protection against the danger of the inhalation of wood alcohol, and whatever interferes with it (poor nutrition, loss of sleep, alcoholism) makes the individual all the more vulnerable.

LITERATURE.

(1) EULENBERG, Lehrbuch der Gewerbehygiene, Berlin, 1876.

(2) POINCARÉ, Comptes Rendus de l'Academie des Sciences, Paris, 1878, p. 622.

(3) TYSON and SCHOENBERG, Journ. of the Amer. Med. Ass'n, 1914, LXIII, p. 915.

(4) LOEWY and HEIDE, Biochemische Zeitschrift, 1914, LXV, p. 230.

(5) MUELLER, Zeitschrift fuer Angewandte Chemie, 1910, I, p. 350.

(6) HARNACK, Korrespondenzblatt fuer Schweiz. Aerzte, 1912, No. 5.

(7) FUEHNER, Biochemische Zeitschrift, 1905, III, Abstr. No. 902.

(8) POHL, Arch. f. experiment. Pathol. u Pharmakol., 1893, XXXI, p. 381.

(9) PLACET, These de Paris, 1912, No. 35.

IN MEMORIAM.

I have been denied the greatest pleasure a pupil is to know—to thank his teacher for the inspiration, encouragement and sympathy.

General G. M. Sternberg, Surgeon-General U. S. Army, Ret., under whose direction the work was done, has now been dead over a year, and it is but in revering his memory that I can do homage to the splendid man and the great scientist that he was.

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PRELIMINARY REPORT OF COMMITTEE ON THE STANDARDIZATION OF THE WORK OF PUBLIC HEALTH OFFICIALS.

Presented before the Public Health Administration Section of the American Public Health Association in Convention at Cincinnati, Ohio, October 24, 1916.

IN THE appointment of this committee, the Rochester convention of the American Public Health Association in 1915 expressed itself in favor of some thought or study relative to the standardization of the work of public health officials. The convention in session voiced the complaint that the public health official who endeavors to make comparisons of work and records of health departments in this country finds that the greatest single need is probably standardization. In other words, there appears to be no standard of measurement.

The public health official already realizes that such standardization will promote a unification of thought and action which will make it possible for him to devise ways and means of fairly competing in the field of public health endeavor.

Business efficiency is nothing more nor less than the application of standardization of business methods to the work to be performed. Wideawake and businesslike administrations have been striving for a local standardization for some years past. The federal government has applied it in the writing and enforcement of laws pertaining to interstate affairs, and it is possible that the federal government may be an agent through which the reorganization of state and municipal health departments can be effected, in order to give the health officer the standard he seeks.

Of course, there has been some attempt made to standardize things pertaining to public health and the action of public health officials, but until an earnest and concerted effort is made to secure the coöperation of all the larger cities, a sporadic attempt at some uniform method is of but little avail. The AMERICAN JOURNAL OF PUBLIC HEALTH in its issue of June, 1913, contained the report of the Committee on Uniform Health Reports of the Massachusetts Board of Health, which was a very comprehensive and commendable outline for the reporting of departmental work, and contained much data that will be of use to this committee. With this exception, the subject has been treated in the abstract only, and during recent years there has come a thorough realization of the lack of a standard, with a visualization of the drawbacks entailed in the effort to make proper comparisons of health rates, death-rates and the progress of public health departments.

Inevitably, it occurs to one's mind the need of greater uniformity in the annual reports of health departments. It is utterly impossible at the present time to make comparisons of any value whatsoever from nine-tenths of the reports one receives.

To the experienced health official, comparisons of appropriations given by municipal legislatures for health work mean nothing unless the statement or report be accompanied by complete information relative to the organization of and functions performed by the health department of that particular city.

The first question which naturally arises is: "What functions are assumed or controlled by the health officer in charge of a health department?" Do they include the care of the indigent and feeble-minded and insane, as well as the complete control over the institutions of correction? Do they include medical inspection in relation to contagious diseases, and medical inspection of school children, to say nothing of the functions assumed by the various sub-divisions of these bureaus or departments? Do they also include control of street cleaning, garbage and waste disposal? Do they include appropriations made for housing betterment or plumbing regulation? Do such appropriations include jurisdiction over municipal baths, comfort stations and lodging houses, and in the broad field of sanitation, do they include with other things, the building and maintenance of municipal reduction and waste disposal plants?

With the work given to the public health official, there should unquestionably be a proper and equitable basis of comparison, in relation to appropriations given, and there should also be a standard distribution of functions to be performed. There can be no standard methods of comparison of rates between health departments that on one hand assume control of street cleaning, garbage and waste disposal, with the health department of a city which assigns these sanitary engineering tasks to another municipal department.

It is the thought of this committee to recommend several forms for departmental work,—one for state boards of health which can be uniform for all states, and others for cities of different sizes, as well as one for small towns. In the larger cities where the laboratory facilities are ample, where adequate food inspection systems may be carried out and where many lines of endeavor are possible that are not so in smaller communities, a much higher standard could be attempted than would be possible in small communities.

In the history of the early days of public health work in the United States, there was a disposition to standardize the work of health officials in the appointment of boards of health. Legislative phraseology may have differed in the final enactment of laws by the various states, nevertheless the one supreme thought presented was that a board of health had absolute control over those things which pertained to health matters. In the preservation of the principle of states' rights, there no doubt went with it the enactment of laws suitable to different localities, and this perhaps was the cause of a diversion from the standard originally laid down.

Very often a public health official in visiting neighboring cities confesses to be astonished in learning of the rules and regulations governing certain classes of public health work, and which rules or laws are almost in direct variance with those that have been enacted in the city of which he is the health officer. His astonishment is the more disconcerting because of his absolute faith and belief in his own rules and laws. His embarrassment is better exemplified in cases of counties whose boundaries are separated by an invisible surveyor's line and where all local conditions are more or less the same.

The recent chaos of quarantine regulations all over the country in the outbreak of poliomyelitis is as good an example as we need of the desirability of standardizing the methods of prevention.

In the compilation of data of nine large cities, which is appended hereto, in tabulated form, it is shown clearly that the functions of the several health officers are many and varied. The tabulation is but a preliminary effort and is not presented with any idea of reaching a conclusion but for the purpose of showing that it is of little avail to attempt to compare the work of one health officer with that of another, when comparisons are given in such statistical form.

This committee will endeavor, through the formation of an Advisory Committee, to standardize the work of such branches of a health department as Child Hygiene, Food Inspection, Hospitals (both for the care of contagious and communicable diseases, as well as the care of the indigent), define clearly the work of the medical inspector, to properly place the control of

APPROPRIATION BY FUNCTION OF THE HEALTH DEPARTMENTS OF VARIOUS CITIES.

	Population last Census (U. S. 1910)	Total Appropriation for Health Department or Bureau	Executive	Medical Inspection	Child Hygiene	Laboratory	Vital Statistics	Sanitation	Tenement House Inspection	Plumbing	Food Inspection	Hospitals, Contagious	Hospitals, Indigent	Garbage Collection	Baths, Comfort Stations, Lodging Houses
		$	$	$	$	$	$	$	$	$	$	$	$	$	$
New York (*A*)	4,766,883	3,358,343 60	*a*271,392.00	*b*522,230 00	664,305.00	*c*208,698.00	68,677.00	248,319 00	Tenement House Dept.	Bur. of Buildings (Borough Gov.)	265,109.00	1,022,445.60	Dept. of Pub. Charities		Dep. Parks Bur. Pub. Bldgs., Dept. Pub. Charities
Chicago (*B*)	2,185,283	*1,600,249 24	49,240 00	348,120 00	*d* 14,000.00	38,430 00	33,220 00	172,568 00	Bur. of Sanitary Inspec.	Bur. of Sanitary Inspec.	158,540 00	*e*52,920 00	*e*17,560	*f*230,231.86	*e*51,920 00
Philadelphia (*C*)	1,549,008	444,010 00	14,980 00	114,500 00	51,230 00	25,660 00	12,750 00	95,170 00	Div. of Housing and Sanitation	Div. of Housing and Sanitation	27,770.00	97,750.00	Bur. of Charities	Dept. of Pub. Works	Board of Recreation
St. Louis (*D*)	687,029	†175,434 80	19,616.13	Under Sanitary Div.		15,136.27	3,881 70	124,198.11		Plumbing Dept.	Sanitary Div.	Hospital Dept.	Hospital Dept.	Garbage Dept.	*h*6,827.77
Boston	670,585	‡315,043 21	147,057.16	*i*10,776.29	56,674.59	15,994 99	Registry Dept.	Under Executive		Building Dept.	35,213.35	*j*32,695 90	Hospital Dept.		16,630 93
Baltimore (*E*)	558,485	§264,188 00	13,290.00	*k*48,080 00	9,420.00	16,430.00	5,580 00	*l*3,000 00	3,000 00	25,843 00	38,880 00	*m*83,095 00	Supervisors of City Charities	Street Cleaning Dept.	Free Public Bath Commission
Pittsburgh	533,905	‖624,898 02	20,167.04	*n*149,684 31	Bur. of Infectious Diseases	Bur. of Infectious Diseases	Bur. of Infectious Diseases	351,790 64	Bur. of Sanitation and Plumbg.	Bur. of Sanitation and Plumbg.	61,284.15	41,971.88	Dept. of Charities	Bur. of Sanitation	
Buffalo (*G*)	423,715	238,142 92	43,522.00	31,401.72	55,062.53	20,837.31	2,450.00	28,711.36	Bur. of Sanitation and Tenements.	18,691 58	27,134.78	Separate Dept. of Hospitals		Dept. of Public Works	10,331.64
San Francisco (*H*)	416,912	884,942 00	51,131.00	28,220.00		13,920.00	3,000 00	19,620 00	3,000.00	11,100 00	38,580.00	45,708.00	662,663		

(*A*) *New York:* Fly and Mosquito Extermination, $2,916. Public Health Education, $17,707. Supplies, $14,190. Buildings and Grounds, $52,355. (*B*) *Chicago:* Municipal Reduction Plant, $324,340. (*C*) *Philadelphia:* Special appropriations made to coroner, city entomologist, department of supplies, and contagious hospital; $4,200 to Health Officer. (*D*) *St. Louis:* Special Appropriation to coroner and $5,774. Fly and Mosquito Work. (*E*) *Baltimore:* Special appropriation to Street Cleaning Department, $5,420, for morgue. (*G*) *Buffalo:* Municipal Reduction by Board of Public Works. (*H*) 0—$8,000 for Morgue, Autopsies and City Burials.

a. Includes $23,910, audit and accounts. *b.* "Preventable diseases." *c.* "Research and vaccine." *d.* "Infant welfare," child hygiene is a division under medical inspection. *e.* Bureau of hospitals, baths, comfort stations and lodging houses. *f.* "Bureau of waste disposal." *g.* Morals commission. *h.* Comfort stations only, bath houses under park department. *i.* "Disinfection." *j.* Includes $4,510.42 for small-pox hospital and $28,185.48 for quarantine. *k.* "Communicable diseases and nuisances." *l.* Abatement of nuisances. *m.* Includes $28,020 tuberculosis, $22,655 quarantine, and $32,420 Sydenham Hospital. *n.* "Bureau of infectious diseases." *o.* City burials only, morgue and autopsies under coroner.

* Includes $100,100 for miscellaneous services and supplies. † Expenditures for 1913-14. ‡ Expenditures for 1912; appropriations for 1915-16, $300,000 (detailed information for 1915 16 not available). § Includes $12,150 miscellaneous item. ‖ Figures for 1913 only ones available.

plumbing, and to outline the functions of the housing branch and those to be performed by the sanitary officer of the municipality, as well as the many and varied functions now given to health departments.

The work of the standardization of these sub-divisions of a health department is a task not to be undertaken by this committee at the present time. It is respectfully requested that this Association authorize this committee to appoint an Advisory Committee, in order to secure the assistance of the very best men in the country in their various lines—men whose opinions and whose practical work are both such as to carry with their expressions confidence and respect. If such an Advisory Committee were to serve, without doubt much valuable information will be secured in the formation of the final report of your committee.

The State Health Officers of this Association can be of very much help in the standardization of State Health Reports and this, of course, should be the first step in the standardization of the work of public health officials.

The report that would be submitted by this Advisory Committee would also cover the standardization of the work of the public health officer in relation to the various sub-divisions of a health department, and this information could be taken up as official reports of the Association, circulated widely through proper channels, and the officers of the committee directed to secure through individual and repeated appeal their adoption by the various health departments throughout the country.

It is the further desire of this committee that the entire Association be asked to coöperate in this effort to standardize the work of the public health official. Criticisms of this preliminary report are solicited, as well as suggestions and information which may be of any help to the committee. It is the desire of your committee that its continuance be permitted for another year, in order to further the effort to bring about a standardization which is conceded by all to be most essential to the efficiency and good of the public health service.

Respectfully submitted,
GUSTAV F. RUEDIGER, M. D.,
CHARLES E. TERRY, M. D.,
LAWRENCE VEILLER,
JAMES F. MCCRUDDEN, *Chairman.*

Committee on the Standardization of the Work of Public Health Officials: Mr. James F. McCrudden *Chairman*, Philadelphia, Pa.; Dr. J. F. Edwards,* Pittsburgh, Pa.; Dr. Gustav F. Ruediger, La Salle, Ill.; Dr. Charles E. Terry, Jacksonville, Fla.; Mr. Lawrence Veiller, New York, N. Y.

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* Dr. Edwards, because of his absence at the front with his regiment, has been unable to concur in this report.

RELATION OF THE PUBLIC HEALTH SERVICE TO PROBLEMS OF INDUSTRIAL HYGIENE.

DR. J. W. KERR,
Assistant Surgeon General, United States Public Health Service.

Read at annual meeting of American Public Health Association, Cincinnati, Ohio, Oct. 24-27, 1916.

IN ORDER to outline properly the relation of the Public Health Service to industrial hygiene, it is necessary, first, to review briefly the growth of this service as a public health agency; second, to define the present-day broader conception of the scope of industrial hygiene; and third, to consider the relative importance of this particular field as compared with the field of sanitation generally.

By successive laws enacted by Congress during the period from 1798 to 1912, the Public Health Service was gradually developed as the federal health agency. While duties occasionally of a diverse character have been imposed upon it from time to time, it became apparent that they were on the whole closely related and were to constitute the general lines of activity in public health matters which the federal government should ultimately follow in increasing degree.

It is significant that the first of these laws, enacted July 16, 1798, founding the service, should have provided for the medical treatment and protection of the health of American seamen—at the time perhaps the most important group of industrial workers of our country. It is significant also that this authorization provided for taxation of the shipping industry in support of such medical and sanitary relief, all vessels of the merchant marine being taxed twenty cents and later forty cents per month for every person employed thereon. While this capitation tax was subsequently repealed and other means of providing funds adopted, it established a precedent for contributions on the part of employers, employees, and the government, in providing sick benefits; it was a health insurance system, in fact if not in name.

This first Act, and in fact all federal laws subsequently enacted in the interest of the public health derived their authority from the clause in the Constitution giving Congress the power to regulate commerce between the several states, foreign nations, and with the Indian tribes. Such commerce in the eighteenth century being confined almost wholly to water transportation, it was natural that the first attempts to exercise this power should relate to navigation and to the protection of the health of those responsible for its safe conduct. The greater exercise of this power in recent years is simply a logical outcome of the development of railroads and the modern interpretation of the term interstate commerce from both judicial and executive standpoints.

By reason of the recurrence or threatened recurrence of epidemics of yellow fever and cholera from 1855 to 1893, the development of sanitary measures to prevent the introduction of these and other quarantinable diseases and to promote commerce were rapidly advanced. In consequence, in the latter year service duties in general included conduct of maritime quarantine, suppression of epidemics, studies of interstate sanitary regulations, collection of sanitary data and their dissemination, and coöperation with state and local health authorities. Additional important duties included the visual examinations of masters, mates and pilots for color blindness, physical examinations of seamen as to fitness for duty, examinations of arriving aliens as to their physical and mental status, and, to a limited extent, laboratory studies of public health matters.

By an Act of Congress approved August 14, 1912, however, still broader authority was provided for investigations of diseases of man and matters pertaining to the public health. Section 1 of this Act is as follows:

"The Public Health Service may study and investigate the diseases of man and conditions influencing the propagation and spread thereof, including sanitation and sewage, and the pollution directly or indirectly of the navigable streams and lakes of the United States, and it may from time to time issue information in the form of publications for the use of the public."

It is thus evident that it was the manifest intention of Congress to provide all necessary authority to investigate unhygienic conditions reacting adversely upon the health of man, and to disseminate the information acquired, as well as to suggest measures for their control. In order to discharge these duties and in accordance with specific provisions of law, the Public Health Service has been developed along broad lines.

There are now almost 500 officers located at different points in the United States and throughout foreign countries. On account of the mobility of the corps, not only may these officers gain wide experience in public health matters, but they may be concentrated and transferred to any point or points where insanitary conditions require investigation and control.

The movements of officers and the policies to be followed in respect to public health matters are directed from the central office at Washington, which consists of seven divisions so constituted that they can be readily enlarged to meet the requirements of new duties and new situations.

A field station and laboratory of industrial hygiene are located at Pittsburgh, Pa., and facilities provided for carrying on bacteriological, chemical and physical investigations.

In connection with its other operations, certain activities of the Public Health Service in the past have related to vocational diseases and industrial hygiene, some of which may be mentioned to indicate their scope. For many years, medical and sanitary care has been furnished to American seamen. During the quarter of a century from 1886 to 1910, for instance, 1,332,878 such seamen were thus cared for. Within a period of ten years ending June 30, 1915, there have been examined mentally and physically 11,502,661 aliens, who have formed an ever increasing army of recruits to the industries. In coöperation with the Bureau of Labor, an investigation of woman and child labor in the cotton mill industry in the United States has been made with special reference to the influence of hookworm disease. In coöperation with other departments, studies have been made of the sanitation of mines and the mining industry in portions of Alabama, Arizona, Colorado, Michigan, Minnesota, Missouri, Montana, and West Virginia. Studies of the sanitation of the steel industry have also been made, including approximately one thousand physical examinations of steel workers, and over six thousand eye examinations of like workers to detect trachoma. Systematic studies of different systems of lighting have been made with special reference to their adaptability for places of employment, the eyes of over one thousand employees of the government alone having been examined as a part of this study. Under an Executive Order of February 28, 1906, sanitary inspections of government buildings in Washington have been systematically carried on; and for the protection of other workers, those suspected of being afflicted with tuberculosis have been specially examined. As a part of this work, special researches have been made of the effects of fumes of cyanide of potash in case hardening processes, of the effects of lead fumes in the printing industry, and special attention has been given to the injurious effects of certain pigments used in the printing process. An extensive series of experiments has been made as to the presence of poisonous gases in certain railway tunnels and their injurious effects upon employees. An investigation of the rag industry in one state was conducted and recommendations made by an officer of the service to the authorities for the control of insanitary conditions in the factories involved. While on detached duty, another officer demonstrated the method of transmission of anthrax by means of biting flies, and as a result of the demonstrated danger of infection of anthrax from dried hides from China, regulation of their importation generally has been provided for. Special studies have been made and data published relating to laws and regulations for factory sanitation with special reference to the prevention of communicable diseases. Systematic studies have been carried on relative to the provisions of the several states for the control of the use of poisons and habit-forming drugs, and a detailed analysis made of all state and territorial laws and regulations relating thereto. A model law for the collection of morbidity reports has been drafted and recommended for adoption to the several states and territories. Among the diseases the reporting of which is contemplated under this proposed law are the following of a vocational nature: arsenic poisoning, brass poisoning, carbon monoxide poisoning, lead poisoning, mercury poisoning, natural gas poisoning, phosphorus poisoning, wood alcohol poisoning, naphtha poisoning, bisulphide of carbon poisoning, dinitrobenzine poisoning, caisson disease, or other disabilities contracted as a result of the nature of the person's employment.

In addition to the above and under regulations of the department, the Public Health Service is required to make examinations of materials of which matches are made, and, on instructions from the Secretary of the Treasury, to conduct inspections of match factories suspected of using white or yellow phosphorus. Under the Act of July 1, 1902, regular inspections are made of establishments in which are manufactured viruses, serums, and toxins for the cure and prevention of diseases of man. Particular attention has been paid to the sanitation of rural sections, the intensive studies and demonstrations of this subject being the natural outgrowth of the discovery by officers of the service of the relation of hookworm disease to health and industrial efficiency and the relation of the undue prevalence of typhoid fever to insanitary methods of waste disposal. Malaria as a factor in lowering the health of communities and interfering with gainful activities has also been the subject of systematic study and demonstration. In fact, malaria, tuberculosis, and typhoid fever may be regarded from a public health standpoint as the most important of all preventable diseases affecting industry. Not only do they prevail unduly among agricultural workers in many sections, causing the largest economic losses of any diseases, but they react unfavorably on all others who are dependent on these workers for food and other agricultural products.

As examples of the more intensive systematic studies that have been undertaken by the Public Health Service may be mentioned the investigation of the health of garment workers in New York and the hygienic conditions surrounding this industry. This included physical examinations of over 3,000 persons, and detailed studies of the hygiene of illumination in 45 workrooms, the effect upon the atmosphere of workrooms of the use of gas heated irons, the general sanitary conditions of the shops, and the home environment of workers.

Studies of tuberculosis in relation to the industries in Cincinnati comprised inspections of 154 factories representing 38 different industries, physical examinations of 19,932 workers, surveys of 138 families in which tuberculosis prevailed with the view to determining the relation of living and economic conditions to the causation of the disease, and observations as to the influence of climatic conditions, floods, population elements, immigration, overcrowding, and other conditions of industry liable to influence the tuberculosis rate.

During studies of the migration of the tuberculous likewise, special attention was paid to the danger to employees from this source in Arizona, California, Colorado, New Mexico, North Carolina, South Carolina, and Texas.

As an aid to the Massachusetts State Board of Labor and Industries, intensive studies have been made to determine the influence on health of the employment of adolescents in the cotton mill industry, 679 minor children having been examined in this connection. Like studies of the rubber industry are being undertaken.

An extended investigation of the sanitation of convict camps located in 25 states has been made, and a model camp planned and supervised in coöperation with the Office of Public Roads.

For more than a year, upon request of the Industrial Commission of Wisconsin, comprehensive studies have been made to determine the health conditions surrounding the employment of women in industry in relation to the fixing of maximum hours of labor for this class of the population.

As a part of the general studies of vocational diseases, and in coöperation with the federal Bureau of Standards, special attention is being paid to hazards of the gas industry. Advantage has also been taken of an opportunity to make systematic studies of the chemical industry, and the broad question of health insurance and its relation to the prevention and cure of disease among industrial workers is receiving attention. Finally, detailed studies have been and are being made of the sanitary and industrial conditions in cotton-mill villages in relation to the origin and prevalence of pellagra.

These various activities are the natural results of the increased industrialism in our country and growth of public health administration, and cannot logically be developed independent of the latter, for the health of the individual worker is dependent on many factors, the majority of which are operative outside of places of employment. In consequence, every insanitary condition must be inquired into. For instance, in studies of high death-rate from tuberculosis among workers in particular occupations, inquiries as to fatigue, dust, overcrowding, and other unhygienic conditions in workshops must be supplemented by studies of personal habits and health conditions in the home and in the community. And in studies of pellagra among mill operatives, special investigations of economic and social conditions in cross section and for prolonged periods must be made in order to throw light on the origin and prevalence of the disease, and adverse conditions, such as impoverished diet overcome, in order to prevent it.

In fact, the scope of industrial hygiene has been so broadened in recent years as to include, in addition to "first aid," "safety first," "physical examinations" and sanitation of workshops, consideration of all the conditions of living and habits of individuals outside of the factory affecting human efficiency. This embraces many functions which it is the special province of health authorities to perform.

In view of the above conception and by reason of precedents already set, it is pertinent to inquire as to the functions of the Public Health Service in this field. In doing so, however, it is necessary to bear in mind that the authority of the federal government extends only over foreign intercourse, interstate intercourse (when it chooses to exercise it), federal territory and federal administrative affairs, and furthermore, that investigation and research are inherent duties of all sovereign powers.

The functions referred to may be enumerated in part as follows:

1. Supervision of the sanitation of vessels and health of crews engaged in foreign commerce.

2. Sanitary and medical inspection of arriving aliens, *i. e.*, exotic recruits in industry.

3. Supervision of the sanitation of vessels and trains and health of crews engaged in interstate commerce.

4. Inspections of government workshops, examination of government employees on request, and administration of preventive inoculations to such employees.

5. Collection of data in relation to the occurrence of occupational diseases and the causes giving rise to their continuance.

6. Investigations of diseases generally in relation to industrial environment.

7. Investigations of industries with a view to devising minimum standards of sanitary requirement.

Under existing sanitary laws, the following activities may be continued:

(1) Furnishing first aid instruction and appliances for the use of American seamen engaged in foreign and interstate commerce; (2) Inspection and disinfection of living quarters of crews in which cases of tuberculosis have occurred; (3) Physical examinations of seamen to determine their fitness for duty; (4) Examinations of recruits for life saving, light house and revenue cutter duty; (5) Furnishing medical and sanitary care to seamen, lighthouse keepers, and life saving crews; (6) Examinations of arriving aliens to determine their physical and mental fitness to engage in industry, and recording data that will throw light on the question of physical standards in relation to different classes of employment; (7) Prescribing measures for the sanitation of trains and premises of common carriers engaged in interstate traffic and inspections of such trains and premises; (8) Inspections of government buildings and workshops; (9) Physical examination of government employees on request; (10) Vaccination of government employees against smallpox and typhoid fever; (11) Inspections of biologic establishments; (12) Inspections of match factories using white or yellow phosphorus; (13) Investigation of problems of industries in relation to health; (14) Dissemination of information bearing on industrial hygiene; (15) Advising other governmental agencies in respect to hygienic standards for use in industries; (16) Suggesting methods by which workers may become more healthy and efficient, and thus overcome labor shortage.

It would be unprofitable to attempt to enumerate all the problems that await solution. As previously stated, some are now subjects of investigation, but a beginning has just been made. Recent studies emphasize this fact and that new fields are opening up. In the case of pellagra, for instance, it has been found necessary to study intensively the whole industrial environment of affected communities to throw light on the cause of the disease, as economic and social conditions are suspected of being important predisposing factors.

It cannot be denied that large numbers of workmen have not had the opportunity of enjoying even in reasonable degree healthful living and working conditions. This has not only encouraged inefficiency and labor shortage, but has caused disease and threatened the public welfare. In consequence, it is to the interest of the employee, the employer and the public to correct these conditions; a common ground has been found upon which all may meet in mutual agreement. By means of investigations and wise counsel in respect to industrial hygiene, the Public Health Service may contribute toward this better understanding and thus indirectly improve labor conditions generally—this depending of course on the spirit of impartiality displayed in approaching these vital problems.

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EYE CONDITIONS SHOWN IN MEDICAL INSPECTION OF SCHOOLS.

Wm. H. Peters,
Chief Medical Inspector, Department of Health, Cincinnati, Ohio.

R. B. Irwin,
Supervisor of Schools for the Blind.

IN ANY program for sight saving and the prevention of blindness it is essential that provision should be made for comprehensive school medical examination.

Under the old plan, many of the children with impaired vision, got through the schools with few resulting bad effects; some were excused from the operation of compulsory attendance; others remained in school using their eyes until they were finally forced into schools for the blind; still others managed to get through school with a progressive eye lesion which enabled them to qualify in middle life as recipients for material relief.

With a competent and adequate corps of school physicians and the coöperation of our oculists we should be able to detect at an early age, errors in refraction and diseases of the eyes which interfere with school progress, which if left uncorrected and untreated may lead to serious impairment of vision, blindness and subsequent dependency.

We must not be satisfied with the mere detection of visual defects among school children. We must have a careful follow-up system which means the employment of tactful school nurses who will see that the recommendations of the doctors are carried out. It is not always an easy matter to convince a parent and it often requires a great deal of time before we see the final result. During the last three years, 4,772 children attending public and parochial schools in Cincinnati, were discovered with defective vision. Two thousand, six hundred and ten of these children or 55 per cent. were benefited by glasses.

It must be evident to those of us who are engaged in the health promotion of school children, that there are many children attending schools who are classified as "partially blind" and "partially sighted" and they constitute an essentially different group heretofore unrecognized and deserving of special training apart from the blind.

The presence of partially seeing children in schools for the blind offers many serious problems.

The traditional method of approach to the blind is through the fingers. So theoretically, the seeing children must either drop out of these schools or conform to the recognized procedure employed in training those without sight.

This is manifestly unfair, for either horn of the dilemma leads to dependency.

In the spring of 1913 the Board of Education in Boston organized a special class for partially blind children. A few months later the city of Cleveland opened a similar class.

Coöperating with Professor R. B. Irwin, Supervisor of classes for the blind in the public schools of Cleveland and Cincinnati, three conservation classes were organized in our city for the benefit of children who had such marked impairment of vision that they could not keep pace with the pupils in regular classes.

The primary object of our classes is to teach the pupils as seeing children and to rescue them from a life of blindness and dependency.

For the purpose of such classes a schoolroom should be selected which has as nearly as possible ideal lighting conditions. In such classes the kind of work which each child is required to do and the method of doing it must be adapted to his peculiar eye condition.

The department of education should place in charge of such classes, teachers who are sympathetic and especially interested in the development of these children who require extraordinary assistance.

Here in our city we are trying to conserve what vision remains, and to promote the general health of the children.

Standards for admission proposed by a local committee of oculists were adopted in May, 1915, following a conference arranged by the Chief Medical Inspector.

General rules have been published for the guidance of teachers and nurses, and in order that they might better understand the handicaps of their pupils, one of our local oculists gave a special course of lectures for the teachers, and normal school girls in training, on the anatomy and physiology of the eye, fundamental principles in optics, and the various eye conditions on account of which the children are in conservation of vision classes. The teachers were enthusiastic and attended regularly. There is no doubt but that they got a good bit out of the practical talks and demonstrations. This year we will give them something a little more advanced.

Forty-six children have been recommended for conservation classes since May 15, 1915, with the following diagnoses:

Myopia	4
Hyperopia	2
Amblyopia	7
Interstitial keratitis	5
Maculae of cornea	3
Corneal opacities	2
Leucoma centralis	1
Congenital cataracts	6
Choroiditis	5
Retinitis	3
Optic atrophy	4
Sympathetic ophthalmia	1
Gonorrheal ophthalmia	1
Trachoma	1
Albino	1
	46

At the present writing twenty-nine of these children are in school; three have been returned to regular classes; one was transferred to the school for the blind; two were granted work certificates and four were placed in the school for mentally deficient children; leaving seven on an eligible list. For various reasons the parents can not see the wisdom of sending children in the last group to special classes.

The Ohio statute provides a state subsidy to day schools for children who can not by reason of defective vision, keep pace with their classmates or if by doing the amount of close work they run a risk of losing their eyesight.

"Any community which fails to make proper provision for children with defective vision must later on pay the price a hundredfold for the economic loss of her citizens."

SOME DIFFERENTIAL REACTIONS OF COLI-LIKE BACTERIA.

PROF. MAX LEVINE,
Ames, Iowa.

FOR some time it has been the aim of water bacteriologists to find some reaction which would serve to differentiate coli-like organisms from different sources, particularly animal sources. The significance of such a differentiation is self evident. It would not only set aside the most serious objection to the colon test, but actually strengthen it. With this object in view, numerous studies have been made in which attention was focused particularly upon the ability of the organisms to form acid and gas from various fermentable substances, but it is only recently that these products have been quantitatively determined and other end products of fermentation studied. As a result of these recent observations, it appears that there are two distinct groups of coli-like bacteria which differ in the way they utilize or decompose carbohydrates and which are characteristically found in different habitats.

The end products of glucose fermentation have been most carefully studied. Considering the formation of free acid, gas, acetyl-methyl-carbinol (the Voges-Proskauer reaction), and aldehydes from glucose, the following differences are noted:

One group gives a distinct acid reaction with methyl-red; yields H_2 and CO_2 in approximately equal volumes; does not form acetyl-methyl-carbinol (Voges-Proskauer reaction negative); but does give rise to substances which give a positive fuchsine aldehyde reaction in 0.5% glucose-peptone-dipotassium phosphate solution. The other group is alkaline to methyl red; yields two or more times as much CO_2 as H_2 by volume; forms acetyl-methyl-carbinol (Voges-Proskauer reaction positive); and the fuchsine aldehyde reaction is negative.

The first group (methyl red positive or V-P neg) is commonly found in animal feces and sewage, and not infrequently in cultivated soils. This may be considered as the true *coli group*. The other group (methyl red negative or V. P. positive) is rarely present in human or animal feces, occasionally found in sewage, quite commonly in milk, and constitutes the prevailing type on grains and in the soil. This may be regarded as the *aerogenes cloacae group*.

B. aerogenes and *B. cloacae* have been recognized as quite closely related forms by many investigators. Aside from gelatin liquefaction they are differentiated by MacConkey on motility, and by Kligler on glycerol fermentation, while Durham describes *B. aerogenes* as a starch fermenter. It is therefore interesting to note that from a statistical study of 132 V. P. positive organisms isolated from soil, these reactions (gelatin liquefaction, motility, and fermentation of glycerol and starch), are very strikingly correlated. Considering the non-motile forms, of which there were 44, as *B. aerogenes* only 4.8 per cent. liquefied gelatin, and gas is formed by 97.6 per cent. from glycerol and starch. The 88 motile strains or *B. cloacae*, on the other hand, almost always liquefy gelatin, 91.6 per cent.; while gas is formed from glycerol by only 9.6 per cent. and from starch by 4.8 per cent.

The subdivision of the *Aerogenes-cloacae group* is therefore simple and quite distinct. Subdivision of the true coli group is a much more complex matter. From a study of the coefficients of correlation of each character recorded with all other reactions, it is possible to pick out a reaction which correlates best with the largest number of other characters. This process may be repeated upon the subgroups, if desired, until no further subdivision upon correlated characters is possible.

A study of 162 V. P. negative or true coli strains, indicates that, on the basis of correlation of characters, there is very little choice between sucrose and dulcitol for the primary division. Sucrose was selected because it is more commonly accepted by bacteriologists and incidentally for the cultures studied, it is better correlated with habitat. In the sucrose positive group motility, determined in semi-solid agar, was best correlated with other characters. Subdivision was therefore made upon motility.

This gives a sucrose positive, motile species *B. communior* and a sucrose positive non-motile group which may be further divided into the species *B. neapolitanus* which gives gas from salicin, and *B. coscoroba* which does not form gas from this glucoside. Possibly these two organisms should be included in a single species as *B. neapolitanus*.

In the sucrose negative group gas from salicin is the best correlated reaction, and subdivision could be logically carried further if desired. The sucrose negative salicin positive subgroup is the species *B. coli* of which there are two varieties, the motile *B. coli communis* and the non-motile *B. coli immobilis*. The sucrose negative salicin negative subgroup may be further differentiated upon motiliy into the non-motile *B. acidi-lactici* and the motile *B. Grunthal*. These last two organisms may perhaps best be included in one species as *B. acidi-lactici*.

The practical value of the subdivisions in the *coli* group is at present problematical but differentiation between the *coli* and the *aerogenes cloacae* groups is certainly of some significance.

The most important tests for differentiation of lactose fermenting coli-like organisms are the methyl red, Voges Proskauer, or possibly the fuchsine aldehyde reactions, motility in semi-solid agar, and gas from sucrose, starch, glycerol and salicin.

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FALLACIES IN THE INVESTIGATION OF WATER SUPPLIES.

H. A. Whittaker,
Director, Division of Sanitation, Minnesota State Board of Health.

For many years laboratory workers have been developing analytical methods for the detection of pollution in water and these investigations have resulted in the establishment of standard methods for this purpose. It is a well known fact that these methods, when properly applied, form an important part of a routine water supply investigation. It is also recognized that a thorough field survey is absolutely essential before a reliable opinion can be offered regarding the safety of a supply for drinking purposes. Unfortunately certain health departments have been depending largely on an analysis of the water, without obtaining first-hand information regarding the environmental, structural and operative features of the water supply. A common practice is to leave the field work to untrained individuals in the local communities. Data sheets and sampling equipment are often furnished to local authorities and private citizens, who collect the field data and water samples on which the safety of a water supply is determined. There are several points in connection with this practice that are dangerous to public safety. By this method, the field survey, which is one of the most essential parts of the investigation, is placed in the hands of an untrained observer who is often incompetent to undertake the work. This same unskilled individual is entrusted with the duty of securing samples of water that must be properly collected if satisfactory analytical results are to be obtained. These samples are then shipped to the laboratory and subjected to most careful examination by skilled technicians when there is no assurance of the accuracy of their collection. This method makes it necessary for the skilled worker to accept facts from an untrained person on the fundamental features of an investigation on which the safety of a water supply is to be judged.

This practice is often the result of a desire on the part of health departments to extend their services to the public, without considering the dangers associated with this method. Frequently, these departments are short of funds to carry on field surveys and this method is provided as a substitute for more thorough work. After the public is educated to such procedure, it becomes very difficult to refuse the examination of samples collected by anyone and from every conceivable source.

In 1903, the Minnesota State Board of Health recognized the fallacy of attempting to investigate water supplies by this method, and since that time has required that the field and laboratory work in connection with these investigations be undertaken by trained representatives of the Board.

In order to show the importance of field surveys and the error which may attend incomplete investigation work, the following table has been prepared from the results of four years' work on water supply investigations in this state.

WATER SUPPLY INVESTIGATIONS, 1912–1916.

Investigations	Results				
	Total		Unsatisfactory		
	Satisfactory	Unsatisfactory	Field and analytical	Field	Analytical
Number.............569	225	344	180	136	28
Per cent.............100	40	60	52	40	8

The 569 investigations represent both surface and underground water supplies from a variety of sources, including wells (dug, bored, drilled, driven), springs, lakes, rivers, creeks, etc. The need for water supply investigations in this state is shown by the fact that 344, or 60 per cent. of the supplies examined, were found to be unsatisfactory in their existing condition. An analysis of the results on these unsatisfactory supplies brings out the fact that 180, or 52 per cent., were shown to be unsafe by both the field survey and analytical results; 136, or 40 per cent., by the field investigation alone, while the analytical results on the date of the investigation were satisfactory; and 28, or 8 per cent., by the analytical results alone, where the field investigation did not show the possibilities of pollution at that time, and further investigation was required. These results show that the field survey was corroborated by the analytical results in 52 per cent. of the cases; that the field survey was the only index of danger in 40 per cent.; and the analytical results the only index in 8 per cent.

These results bring out very forcibly the importance of thorough field work, for had the analytical results been accepted as the only index, 40 per cent. of the unsatisfactory supplies would have been approved. It is also true that had the analytical work been omitted, 8 per cent. of the unsatisfactory supplies would have been overlooked. It is evident from these results that both a field and analytical investigation should be made before an opinion is given as to the safety of a water supply from a sanitary point of view. The field survey should give an accurate idea of the possibilities of present and future pollution, while the analytical results should provide information on the sanitary condition of the water at the particular time the investigation is made, and may furnish some information on the past history of the water. The field survey and analytical results together should afford information on which recommendations can be made for the protection or abandonment of the supply.

It should be thoroughly appreciated that the use of any method in the investigation of water supplies which provides for the collection of haphazard information by untrained individuals is a dangerous practice. Judging from the published material of various health departments, there appears to be little uniformity as to the collection of data on which opinions are offered regarding the safety of water supplies. It would seem that a comprehensive survey of the methods of all state departments, at least, would be desirable at this time. These data would provide information on which recommendations could be made with the view of unifying the irregular procedures now in use. It is appreciated that a variety of conditions attend the work of public health departments in different sections of the country, but a standard procedure could be outlined toward which all could work.

THE NECESSITY OF GRAPHIC ILLUSTRATION OF SANITARY CONDITIONS IN A COMMUNITY.

M. R. Mobley, M. D.,
Health Officer, Florence, South Carolina.

I ASSUMED charge of the health department of Florence, South Carolina, during the latter part of July, 1916, just after the memorable storm of that month, during which time there were twenty-three and one quarter inches of rainfall within a period of thirty-six hours.

As a result of this great amount of rain, with the accompanying wind storm, the city was left in an extremely unsanitary condition. Owing to the lack of a complete underground system of drainage, water stood in all the low places, on the streets, in cellars, and in thousands of tin cans, tubs, and buckets. The ground was so saturated with water that there was practically little drainage through the soil. This stagnant water afforded a breeding place for countless numbers of mosquitoes; with the resulting danger of malaria from this source.

At this time only about forty per cent. of the population of Florence were using city water, although city water was available to approximately sixty-five per cent. of the total population. Practically all the wells in the city were filled with water to the surface of the ground, and in a great many instances the wells were overflowing. A test of the well water for gas forming bacillæ was not necessary, as you could see gas bubbles rising to the surface of the water. Through surface drainage the wells became reservoirs of all the filth on the premises; thereby increasing the danger of typhoid, dysentery, cholera-infantum, and other water borne diseases.

A number of our sanitary surface closets were in an extremely unsanitary condition, some were without cans, and in some instances actual soil pollution was being carried on, thereby doubly increasing the danger from drinking surface water.

In North Florence, the main negro district, where there is no system of sewers, or underground drainage, the stagnant water was so deep in some places, that the negro residents had to wade to their homes.

This stagnant water, together with decaying organic matter, produced numerous disagreeable odors.

At a glance, one would naturally see that the conditions which I have described above needed an immediate remedy in order to prevent the occurrence of an epidemic of some contagious disease. City council immediately appropriated sufficient funds to place city water for drinking purposes within reach of practically the entire population. Over each spigot was placed a placard, bearing a warning against drinking well or pump water. In this manner we eliminated the largest single factor that might be productive of an epidemic.

We secured an oil wagon, and several barrels of unslaked lime, and made a house to house canvas of the entire city, oiling all wells, stagnant pools, ditches, in fact any body of water. All tin cans or buckets that could hold water were turned over. All low lying places were limed thoroughly. In each instance we gave the owner of the premises explicit instructions as to how to keep their places in a sanitary condition.

All of the city departments coöperated in trying to relieve the distressing conditions at the earliest possible moment; the street department facilitated the work greatly by draining off all stagnant pools where it was possible to do so.

At this time the department had no record of conditions from which we could plan a satisfactory method of operation. There was no complete record of the number, location and condition of surface toilets; thus leaving us at a loss as to where to expect the greatest degree of danger. We had no record of existing sanitary closets where the property owners had failed to install the sanitary closets as prescribed by law.

We had no knowledge of the number, location, or condition of wells, pumps, or stables.

Our record of existing contagious diseases was incomplete.

A study of the foregoing conditions, with a complete lack of records, made it evident that we would have to make a sanitary survey of the entire city, covering the following points:

General.—Date; street; owner; occupant; race; children of school age, M. and F.; boarders or roomers; other occupants.

Contagious Diseases.—Typhoid; infantile paralysis; small-pox; diphtheria; measles; pneumonia; tuberculosis; pellagra; meningitis; scarlet fever; whooping-cough.

Environment.—Water supply; city water available; kitchen sop disposal; sewer connections; sewerage available; horses; cows; stables, distance from house; surface closet, distance from house; yard, drainage; milk supply.

Remarks.

The survey had to be completed, and records tabulated before we could plan a satisfactory method of procedure.

A recapitulation of the survey shows the following:

White population, 4,991

Colored population, 4,115

Total population, 9,106

White children of school age, 1,077

Colored children of school age, 976

Wells, 508

Pumps, 288

Horses, 322

Cows, 148

Stables, 382

Surface closets, 1,441

Wells and pumps where city water is available, 209

Surface closets where sewerage is available, 450.

Such a large number of surface wells and closets must constitute an ever ready source of grave danger. Our survey showed 209 surface wells and 450 surface closets were being maintained where city water and sewerage were available. Using red pins we denoted on a map of the city the location of each surface closet within the city. This map graphically illustrates the number and location of surface closets in any portion of the city. When we succeed in having the use of a surface closet discontinued by the installation of sewerage, we denote the same by removing a red pin and inserting in its place a white pin. It is my purpose at a later date to denote the location of surface wells in the city by using a map with different colored pins.

The survey enabled us to locate all stables in the city. This information will be of great value in the spring when we begin our active campaign against the fly, by assisting us to readily inspect all stables, and instruct property owners as to their proper care.

With the above information, and with the coöperation of the physicians, we have obtained a complete record of all contagious diseases existing within the city. Upon the reporting of a new case of any contagious disease, we denote the location of the same by inserting a specifically colored pin in the map of contagious diseases of the city. We denote the location of recovered cases by the use of ring pins of the same color.

By a comparison of the map of contagious diseases and the map of closets and wells, we can see the general conditions surrounding the contagious disease in question, and can properly instruct the surrounding community as to the best method of protection.

It is especially gratifying to the health department to be able to report that since the occurrence of the storm we have had only seven cases of typhoid fever, originating within the city, practically all of which have been in those areas where surface closets and wells are most numerous.

Book Reviews.

Preventive Medicine. *Edited by Wm. A. Evans, M. S., M. D., LL. D., Ph. D., Professor of Preventive Medicine, Northwestern University Medical School. Vol. VII of the Practical Medicine Series, 1916. The Year Book Publishers, 327 La Salle Street, Chicago. 380 pp. Cloth, $1.50. Series of 10 vols., $10.00.*

This handy little volume contains within less than 150 pages of clear type and good paper the most comprehensive and most helpful survey we have seen of the year's progressive preventive medicine. It is a digest of the utmost value, consisting of summaries of the more important activities and publications of the year, seasoned now and then with those crisp and satisfactory editorial comments which Doctor Evans so well knows how to introduce. The distinguished president of the American Public Health Association here shows himself at his best as he ranges rapidly, yet thoroughly, over the vast field of preventive medicine pointing out to us here an important new movement, there a fresh discovery, and beyond a helpful piece of original work. We follow him with amazement and with pleasure; amazement, at the rapid and extensive growth of the field; pleasure at its performance and its promise.

The text is readable, and rich in information. Charts and tables, statistics and references to literature, are abundant but not superabundant, while one good index of subjects and another of authors, fit the volume for quick and easy reference.

In these days of extreme specialization and differentiation, integrating digests like Doctor Evans' are indispensable. It is rarely that an editor can be found for this all-important work having even a fraction of the wide experience, vast information, digestive capacity, good judgment and editorial ability, of the president of the American Public Health Association. It is a pleasure, therefore, to commend in the highest terms the public service which Doctor Evans has performed in the preparation and publication of this survey of one year's progress in preventive medicine and public health science.

W. T. Sedgwick.

A Monograph on the Epidemic of Poliomyelitis in New York City in 1916. *New York: Department of Health. 1917. Quarto, 391 pages, including half-tones, charts, maps and tables. Price, $1.50 postpaid.*

This interesting report opens with a detailed historical description of the beginning of the 1916 epidemic of poliomyelitis in New York City, tracing its progress and enumerating the steps and measures taken in marshaling the forces of the department of health in the attempt to prevent the disease from spreading, when the seriousness of the situation was apparent.

An investigation by the department after June 6, on which date two cases of poliomyelitis had been reported, disclosed the fact that there were in reality twenty-nine cases in the section of Brooklyn at the time these two cases were reported. Also during May and the first ten days in June, fifteen cases had been reported whereas there were ninety-three cases that had not been reported, showing the prevalence of the disease at the start.

The cost of fighting the epidemic was $317,000, a startling figure, but a guide to go by in fighting other diseases and proving that prevention is the cheaper way.

In reference to the many experiments carried on with monkeys and other animals as to the causative agent of the disease, the report states that, "Notwithstanding their many experiments, full proof is wanting that the minute organism described by Flexner and Noguchi in 1911 is the specific cause of poliomyelitis."

It is interesting to note that no cases occurred on Governor's Island where there were eighty children or on Barren Island where there were 350 children under sixteen years of age. Barren Island has many large rendering plants as the garbage of the city is brought there, and as a result is infested with rats, flies and mosquitoes.

The numerous suggestions as to the cause of the epidemic that were received by the department from the laity and others, furnishes a humorous section to this otherwise serious subject.

The age incidence shows that over 90 per cent. were under 10 years of age. Also, that 599 cases or 10 per cent. of 5,496 cases that were carefully studied, were probably due to contact.

What may prove to be of importance was the fact that over 81 per cent. of 1,350 children tested for the Schick Test at the Willard Parker Hospital gave a positive result, and the conclusion drawn, "that a susceptibility to one of the less contagious diseases indicates that the child is also more apt to be susceptible to other contagious and infectious diseases."

Multiple cases in the same house, housing conditions, nationality and the relation to other infant diseases are discussed. The comparison of the prevalence of the disease with diphtheria, on the different floors of tenements showed a surprisingly close comparison in view of the question of the spread of the disease by contact.

The conclusion was reached that, "we must, until new information as to carriers and means of transmission is forthcoming, rely upon early diagnosis, prompt notification, hospitalization or equivalent home isolation, a well informed public and an alert medical profession."

The chapter on "Insects as Carriers of Infection" is by Prof. Charles T. Brues, who discusses the possibility of insect transmission from various angles and closes by saying, "Among the unknown factors which cause the greatest confusion in interpreting epidemiological evidence are (1) the length of the period of incubation; (2) the number of mild, abortive or unrecognizable cases and carriers of the virus and their relation to infection and immunity; (3) the duration of infectivity in clinically recognized cases; and (4) positive knowledge of the presence of the infective agent in insects, domestic animals, or other possible intermediate hosts or reservoirs of the virus."

Chapters on pathology, symptomatology, diagnosis, and prognosis will appeal to the practising physician. A series of maps in the appendix shows the progress of the epidemics by month periods in the different boroughs of the city. Many tables of value are given including one of a list of the world epidemics of the disease since 1841.

From a study of the results of the epidemic the reports states, "Two apparently just inferences may be drawn from a study of the records:

"1. That hospitalization, when prompt and applied to all but moribund cases, probably checks the spread of the disease and determines a lower incidence under similar housing conditions than where removal to hospitals is delayed and many cases are left in their homes.

"2. Isolation of groups of children from contact with other children or adults, even when carried out in the midst of areas where the disease is prevalent, suffices to protect such children almost absolutely from infection, in spite of the use of identical water and food supplies, and exposure to the same atmospheric conditions and winged insects."

Altogether it is a very complete and full report of one of the most bewildering epidemics that a health department has had to face in recent years.

Stanley H. Osborne.

The City Milk Supply. *Horatio N. Parker. New York: McGraw-Hill Book Company. 1917. Illustrated. Price, $1.50 net.*

"The City Milk Supply" is the very appropriate title of a new book by Horatio Newton Parker, formerly Health Officer of Montclair, N. J., lately instructor in municipal and sanitary dairying at the University of Illinois, and a member of the International Association of Dairy and Milk Inspectors. The book contains seven chapters in which the author has written of the Principal Facts Regarding Milk (Chapter 1), Diseases Communicable in Milk (Chapter 2), Dairy Cattle on the Dairy Farm (Chapter 3), Sanitary Milk Producing (Chapter 4), Transportation of Milk (Chapter 5), The Milk Contractor or Dealer (Chapter 6), and the Control of Public Milk Supply (Chapter 7).

As a result of the author's wide experience and observation he has been able to combine in the various chapters the latest and most reliable information pertaining to the above subjects. The author has also drawn freely from the work and observations of others, for which he freely gives credit; in fact one of the valued features of the book is the excellent bibliography of the literature reviewed by the author and relating to the production, transportation, reparation and distribution of milk for city consumption. Milk producers, milk dealers, and consumers of milk should be greatly benefited by a careful study of Mr. Parker's work. The dairy investigator and student of the dairy industry will find in it much of permanent value. The health officer or dairy inspector, on whom rests the responsibility of protecting the public health from milk-borne diseases, will find this timely publication to be a reliable guide. This particularly authoritative volume should be, and doubtless will be, highly appreciated by all who have to deal with the safeguarding and improvement of milk supplies.

Ivan C. Weld.

Health Department Report.

New Haven, Connecticut.

The Annual Report of the Health Department of the City of New Haven, Conn., for 1916 is to be commended for its frank and clean-cut discussion of its community problems, particularly the excellent critical discussion of the Bureau of Communicable Diseases. It is evident that Dr. D. M. Lewis, Director of the Laboratories and of this Bureau, in his report to Doctor Wright, Health Officer, has followed closely the examples set by such men as Chapin, Levy and Terry, and the result is of peculiar interest to all concerned.

New Haven is a city of an estimated population of 160,000. The general death-rate for 1916 was 15.87, but if one excluded from the total number of deaths the 961 deaths which occurred in public institutions there would be a resultant death-rate of 9.86 per 1,000 population. The death-rate per 1,000 from epidemic diseases was 0.74. Respiratory and circulatory diseases were the chief causes of death.

One hundred and sixty-four cases of diphtheria were reported during the year, a reduction from the previous year when 272 were reported. Eighteen nasal carriers were discovered. Four deaths were attributed to this disease. Forty-four cases and five deaths were bacteriologically, clinically, and epidemiologically primarily streptococcal. From a study of these cases it was made evident that: first, diphtheria antitoxin, though given early and in sufficient doses, cannot save lives of septic sore throats; secondly, that associated with the above cases in some families were other manifestations like pneumonia, erysipelas, and septic processes which were from the same preventable source. Streptococcal nasal carriers in the neighborhood of these cases were found "in startling frequency." Of two other deaths charged to diphtheria, one was due to measles, the other to status lymphaticus.

There were 185 cases reported or held as possible scarlet fever cases. Only 77 per cent. of these cases and only one of the four deaths resulting were of patients under fifteen years of age. Since it is stated that 90 per cent. of all cases of true scarlet fever and 90 per cent. of the fatalities are under fifteen years of age, here is another case of faulty diagnosis. It is shown that of these 185 cases, only 84 cases were found to be cases of scarlet fever, resulting in one death; the other cases were either grippe or withdrawn diagnoses. In tracing the 84 real cases one carrier under five years and five carriers over five years of age were found. If this sort of faulty diagnosis really does prevail here, it is likely that the error extends throughout the country, and the incidence of these two diseases is grossly exaggerated.

Two hundred and thirty-five cases of measles were recorded with seven deaths. It is felt that this is a true record. Cases of measles are released only when there is absence of inflammatory signs of nose and mouth. There were 64 cases of typhoid fever reported with 12 deaths. Of these, four cases and four deaths were of non-residents; one case and one death was lobar pneumonia; one case and one death was miliary tuberculosis. This represented a drop from 20 deaths of the previous year, and gave a mortality of .04 per 1,000 inhabitants, a good sanitary index. A sewer and a hopper closet which previously were responsible for numerous cases and eight to nine deaths gave none this year, the closet being locked, the sewer being improved. Other methods of attack have resulted favorably, and plans for the future against bathing in certain localities, against clam-digging, and against privies should pull this rate down still further. Infantile paralysis claimed 22 deaths of residents. Excellent results were accomplished in limiting this devastating epidemic. It is interesting to note that the comparatively satisfactory results were accomplished at the low expense of less than $2,500, while neighboring Connecticut cities spent from $11,000 to $27,000. There were 79 deaths under one year of age due to diarrheal diseases, or 49 per 100,000 population. This low record is attained, it is believed, by clean, short-hauled fresh milk, without pasteurization. One of the recommendations for this department is that an adequate field force be provided for the systematic controlling of nasal carriers among the careless, unfortunate, and ignorant.

Food inspection has advanced rapidly and satisfactorily, an advance greatly aided by the obvious coöperation of certain proprietors and dealers. A municipal slaughtering house is advocated.

With the rapid growth of this city the problem of the milk supply is becoming more complex, and will necessitate longer hauls for this product, and the supply will have to come from outside the state. At present the 739 dairies supplying New Haven with milk are rigidly inspected and must satisfy the requirements. Notices are served on unsatisfactory dairies and failure to improve conditions thereafter prohibits their selling within the city. Health Officer Wright has frequently put himself on record as opposed to the pasteurization of the city milk supply, but it is of interest to note that due to a serious epidemic of septic sore throat which prevailed in nearby districts this last year, undoubtedly due to milk, he has changed his views so that now he is an ardent believer in pasteurization if properly supervised, though he has no confidence in pasteurization as done for commercial purposes.

Other work by this department has been along the same excellent lines though space does not permit its detailed description; such for instance as the laboratory work, medical inspection of schools, dental clinic, and public health nursing service. All in all it is an excellent report of a vigorous policy, and well justifies New Haven's increased health expenditures during the last five years of from 15 cents to 25 cents per capita.

Public Health Notes.

Are Schoolrooms Drier Than Deserts.—George T. Palmer, Chief of the Investigating Staff of the New York State Commission on Ventilation, inquired into the verity of the statement that the air of schoolrooms in our northern climate during winter weather is drier than the air of deserts, and if relative humidity should be the sole criterion of dryness. Observations were made in selected schoolrooms, some of which were ventilated by means of plenum fans and gravity exhaust ducts, the air being humidified before entering the room. The windows in these rooms were kept closed. The average relative humidity in these rooms, from December 11, 1916 to January 31, 1917 was found to be 25.6 per cent. The average temperature was 68.08° F. and the volume of air entering each room was estimated at 1,100 cubic feet per minute.

The second group of rooms was ventilated by means of open windows and gravity exhaust ducts. The air flue varied from about 200 to 1,100 cubic feet per minute. The average temperature was 67.66° F. and the average relative humidity, 27.7 per cent. In 184 sessions held in the first group of rooms, the teacher complained of dryness, 59 times. In 189 sessions held in the window-ventilated rooms, complaints of dryness were received only on four occasions. The average relative humidity of desert air varies from 23 per cent. to 40 per cent.

The rate at which a body of water or a wet surface gives off water depends on three factors, namely, temperature, relative humidity, and rate of air movement. The author studied the factors effecting the evaporation of water from the living body, from the nose and lungs and the sensation of dryness and its cause. The following conclusions are drawn.

1. Schoolrooms admittedly dry and drying do not appear to be as dangerous to health as deserts.

2. Schoolroom air may and does contain less moisture during much of the winter season, than in desert air.

3. On the basis of their dehydrating power, schoolroom air is not drier than the air of deserts.

4. Schoolrooms, at low relative humidity, but

without excessive, continuous air flow and too great warmth (over 68 F.), do not ordinarily feel uncomfortably dry.

5. Relative humidity by itself is thus a criterion of neither dryness, nor dryingness, nor the sensation of dryness.

* * *

Social Hygiene in War Time.— In the July issue of the *Social Hygiene Bulletin*, Massachusetts Edition, some of the precautions that have been taken to make the army camps and naval stations as free from vice as possible, are outlined. Investigations, coöperation with the various police and municipal authorities throughout the country have been set in motion in order to protect the young men who have entered the service of the government. The most important places where action has been taken are Newport, R. I., El Paso, Forth Worth, and Waco, Texas, St. Louis, Mo., San Francisco, and Plattsburg. The government is determined to reduce all types of disease to a minimum.

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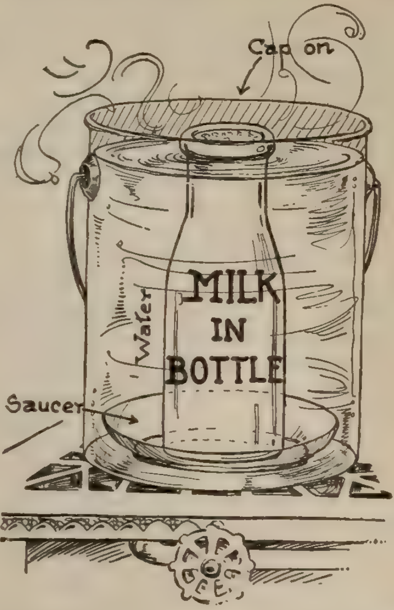
Water Sterilization by Halozone.—*The Mississippi Valley Medical Journal* for August, 1917, tells of the use of halozone for sterilizing water. For this substance and its use in treating water supplies, we are indebted to Dr. H. D. Dahen and Dr. E. K. Dunham. The substance is known chemically as para sulphodichloraminobenzoic acid. Halozone is prepared in tablet form. It is a powerful germicide, more stable than any chlorine preparation now being used for this purpose, and the resultant sterilized water is not unpleasant to the taste. Four milligrams of halozone will sterilize one quart of water. Laboratory tests show that drinking water containing B. coli, and polluted by pathogenic organisms such as B. typhosus, B. paratyphosus A and B, B. choleræ, B. dysenteriæ (Flexner) and (Shiga) and 5 per cent. sewage are made sterile in from 15 to 60 minutes by the use of halozone in concentrations of 1 to 200,000 to 1 to 500.000.

* * *

Home Pasteurization.—By courtesy of the Chicago Health Department we are permitted to show a simple device for home pasteurization of milk. The directions follow:

"The milk should be mixed and poured into clean bottles, which should then be stoppered with clean, absorbent cotton. Place the bottles in a kettle filled with cold water to a point a little above the level of the milk; heat the water and allow it to boil for five minutes. Cool rapidly and place on ice. If barley water, rice water, or other ingredients are to be added to the milk, this should be done before pasteurizing. After the bottles are prepared they should not be opened until feeding time."



Simple Device for Pasteurizing Baby's Milk at Home.

* * *

The Care of the Feet.—In the August number of *The Nurse*, Dr. A. W. Herr considers this subject, emphasizing particularly such ailments as flatfoot, cold feet, sweating feet, corns, chilblains and ingrowing toe nails. The arch is very important to the foot, as upon it is sustained the whole weight of the body. The higher the arch, the better the walker and the less the fatigue.

Shoes should of course fit the foot comfortably, and should fit well. Over 10 per cent. of the people suffer from the flatfoot deformity, an ailment which the shoeless man never experiences. Tight shoes or loose shoes should be avoided. Likewise high heels and high shoes. A shoe should not pinch at the heel, and should not turn up at the toes. Pointed shoes should also be avoided.

It is a good plan never to help a muscle by a brace or bandage. The muscle should be exercised. It will then help itself. Stockings should be long enough to fit the foot comfortably and should be changed frequently. It is well to massage the feet too, and to bathe them often.

Flatfoot is said to be caused by rickets, obesity, general muscular weakness and periods of long standing. The main cause, however, may be laid to tight shoes which interfere with the muscular action and circulation.

Cold feet are also due to tight shoes and are more prevalent among women and girls than among men. Women are more sedentary, their ankles are generally poorly protected and they wear thin-soled shoes. Exercise, alternate hot and cold foot baths before retiring and daily change of stockings are mentioned as remedies.

Sweating feet are usually due to sympathetic disturbances from the stomach. Cloth shoes should be worn as much as possible and such desiccants as alcohol, tannin, alum or salicylated talc may be used. It is also wise to permit a lather of soap to dry on the feet before putting on the stockings.

Corns are always due to improper footwear. The best treatment as a rule is to use a proper shoe.

Chilblains are supposed to be due to diminished blood coagulability.

Ingrowing toe nails should never be cut roundly at the corners. They should be allowed to grow beyond the end of the toe, cut off squarely and kept in that condition.

⁂

Sanitary Reserve Bill.—On August 30, the Sanitary Reserve Bill, which was introduced into Congress some months ago by the State and Provincial Boards of Health, and which has already passed the Senate, was finally reported favorably by the House Committee on Interstate and Foreign Commerce in whose hands it lay. It is expected that the bill will soon pass the House.

The bill is somewhat changed but retains the important original provisions. The bill, a modification of Senate Joint Resolution 63, provides for a Reserve Corps of the United States Public Health Service to be composed of officers of state, county, and municipal health organizations, and other persons skilled in sanitary science. Appointments are made by the President upon the recommendation of the Surgeon General. The commissions carry the grades of assistant surgeons, past assistant surgeons, or senior surgeons in the Reserve Corps for four years or during the period of the present war.

Sanitary engineers, assistant sanitary engineers, epidemiologists, and assistant epidemiologists may also be commissioned, their respective grades being prescribed by the regulations of the Public Health Service.

The duties of the Reserve Corps are to be performed under instructions of the Surgeon General and shall be directed toward the proper sanitation of ports and places within the United States or within its jurisdiction, including especially places in which industrial and military forces are mobilized.

The United States Public Health Service is to coöperate with state, county, and municipal health organizations with a view to coördinating their activities and making their work effective.

Further progress of the bill will be reported in the October JOURNAL.

⁂

Automobile Typhoid.—The *Municipal Journal* for August 9, 1917, speaking editorially on this subject, warns against the increase of typhoid among city dwellers, through their drinking, during automobile tours, water which was polluted. During August, September, October and November, 1916, the typhoid cases in St. Louis totaled 429 as against 162 for the same period of years previous. Upon investigation it was found many of these cases of typhoid were among those who had motored out to the country immediately surrounding the city, and who had drunk of wells and springs, subsequently found to be polluted.

⁂

Ohio Changes Health Organization.—The Ohio State Board of Health has been abolished and a State Department of Health substituted. James E. Bauman is Acting Executive Officer. A State Commissioner of Health and four members of the Public Health Council are to be appointed.—*Ohio Public Health Journal.*

Public Health Clippings.

An Old Health Certificate.

Boston, August ye 13 1776

These certify that Eabenesor Stimpson has been so smoak'd and cleansed as that in our Opinion he may be permitted to pass into the country without Danger of communicating the Small-Pox to any one.

(SGD) JOHN SCOLLAY
NATHL. APPLETON
Selectmen of Boston

(*Copy of original in Boston Medical Library.*)

* * *

Disgusting, But True.

"If saliva stained things blue, what a blue world this would be. . . . In fact, it would be a study in blue. Door knobs, handles, street car straps, window ledges, magazines and books in libraries, doctors' offices, and private homes would all have blue covers. There is no limit to the common exchange of saliva!"—New York *Weekly Bulletin.*

* * *

Calmette Succeeds Metchnikoff.

Albert Calmette, director of the Pasteur Institute at Lille, is 54 years old. He founded the Pasteur Institute in Indo-China and discovered there a ferment with which alcohol can be extracted from rice, but it was at Lille that he perfected the antivenom serum for snake bites. In the campaign against tuberculosis he was one of the pioneers, his preventorium being one among if not the very first established. He has remained at Lille during the war, but has now been called to Metchnikoff's vacant place in the Pasteur Institute at Paris.—*Jour. A. M. A.*, July 28, 1917.

* * *

Alligatorus Sewerensis.

Old Ben King, down at Fort Meade is none of your high-toned engineers but he pulled off a stunt that got his picture into every engineering journal from hither to yon. It was a method of unstopping a sewer. Like Columbus balancing the egg, anybody could do it, but it took Ben King to show 'em how. All he did was to tie a rope to a little alligator, and put him down through the manhole, whereupon the little 'gator threaded his way through to the next manhole, where he was taken out, and then the rope see-sawed back and forth between the manholes—if need be a chain drawn through—till the sewer was clean. That's what Sam Weller would call the "art of inwention."—*Florida Health Notes.*

* * *

Signs We Should See—But Don't.

"Poor food store."

"Try our fly specked cakes."

"The dirt in our store cannot be beaten."

"We handle warm and dirty milk."

"Special inducement to children—candies with dust on them."

"Eggs we know are not fresh."

"Milk guaranteed to cause diarrhœa in babies."

"We carry a complete line of noncuring patent medicines."—*Cumberland Bulletin.*

* * *

The Worm Turns.

I hereby give notice to the doctors of Canton that from this date my price to them will be 50 cents for each shave and a dollar for each hair cut and that double prices will be charged for all work done after 7 o'clock in the evening, and if it shall be necessary for me to visit them and do work for them while confined in their home for sickness an additional charge of 25 cents per foot for every foot traversed going and coming will be made.—E. P. Arquitt.—From the Canton (New York) *Plaindealer.*—*Lansing Public Health.*

* * *

The Passing of the "Certificate of Health."

Here and there in California, physicians are furnishing certificates of health to prostitutes, knowing full well that the statements are for use in soliciting. Just how a self-respecting physician can accept a share of the profits of prostitution and give in return a statement intended to increase the illegal practice is difficult to understand. Within the past few days a part-time health officer told how he gave these certificates, charging two dollars for each examination. When Doctor X., as private practitioner, discovered a case of active syphilis, did he, as health officer, isolate it and supervise it? No. He had no idea what became of the cases, or to what extent they continued to spread infection broadcast.

In connection with the beginning of the new campaign against venereal disease in one of our cities, several cases of syphilis were reported as coming from one clandestine prostitute. When looked up, she presented a recently-dated card from a local physician, certifying that she was free from all "sectual and venerial" diseases. Examination showed that she was syphilitic. Evidently the complaisant physician was equally thorough in physical examination and in spelling. The physician who issues such cards to prostitutes for use in soliciting, is a partner in their illegal business and a menace to the public health.—*California Monthly Bulletin.*

✣

Have you a fly, a flea, a bedbug or louse,
Living with you in your home or your house?
They are all alike, all nasty, 'tis true,
But it's a slam at your home—a disgrace to you!
—*Buffalo Sanitary Bulletin.*

✣

Patent Medicines.

One can hardly pass a day without being reminded to be "economical" and to "do his bit." All of which we approve, but we add, stop buying worthless patent medicines, thereby saving your health and money.

"A sucker is born every minute." Judging by the amount and large varieties of patent medicines, we think this is a modest estimate.—*Cumberland (Md.) Health Bulletin.*

✣

A Query.

Why will a man submit peacefully to the quarantine restrictions placed upon his child which has been exposed to a contagious disease and "raise the roof" when the order is issued that his dog must be muzzled?—*Connecticut Health Bulletin.*

✣

Doctor:

Do *not* register your baby as a *boy* if it is a *girl.*

Do *not* register your baby as a *girl* if it is a *boy.*

If the *maiden name* of the mother is *Mary Jane Doe,* do not indicate it as *Mary Jane,* omitting the *Doe.*

If the *father's name* ends with *two t's* or *two e's,* do not try to improve his method of spelling by leaving off a *t* or an *e.*

Remember, the *State Law* requires certificates to be in this office ten days after birth.

Unless this matter is heeded by the offenders, we are going *to be forced* to an unpleasant duty.

Doctor, let us agree to *practice reciprocal reception.*—*Spokane Monthly Report.*

✣

Don't procrastinate
But vaccinate.
Otherwise Smallpox
Will get you
If you Don't Watch Out.
—*Chicago Bulletin.*

✣

Poisonous Beans.

The attention of the Department of Health has been directed by the United States Government, to the fact that a variety of bean known as the Burmah White, or Rangoon bean, and laboring under the scientific name of "Phaseolus lunatus," has been sold in large quantities in the United States and Canada.

This bean has been planted by the acre, and in no case has it come up. Furthermore it is poisonous. Analyses of samples taken in Toronto and analyzed in our laboratory show it to contain .028 per cent. prussic acid, and cases are on record, in Holland for example, where people have died from eating it.

The Rangoon bean is a small, yellowish bean, with marked lines radiating from the small eye on the concave surface. These radiating lines and its yellow color serve to distinguish it from the small white bean.

Its importation has been recently stopped by the government as an injurious article of food.

We understand that this variety of bean has not been used by canners to be made into pork and beans, so that there would be no danger to fear from that source.—*Toronto Health Bulletin.*

✣

Bringing up Baby.

In answer to the question as to what we are doing for our baby, we would say that up to date we have fed him on sterilized, unsterilized, pasteurized, cow's, goat's, condensed, peptonized, and modified milk. We have rocked him to sleep, sung him to sleep, and let him howl himself to sleep. We have dosed him with hot water, peppermint, ipecac, and soothing syrup. We have rubbed him with goose oil, olive oil, and cod-liver oil. We have patted him on the stomach to the tune of "John Brown's Body." We have shaken a rattle before his face for three quarters of an hour. We have given him mental treatment, vibration treatment, and turned red, blue, and green thought on him for hours. We are here to take orders and advice from everybody, and if you have the slightest thing to suggest that we have not already done to that baby, do not tell us—we may forget it. But write it down, and send it along at the earliest possible moment.

Yours respectfully,

THE BABY'S PARENTS.

—*West Virginia Bulletin* from *Life.*

Season of Cosmetics is With Us.

Freckles! scream the headlines of disguised advertisements in scores of newspapers, these days. *Be beautiful,* advise others, at so much per. In addition, one bottle of Punkadora will cure you of fainting spells, leprosy, falling of the hair, cold feet, heart disease, cramps, hangnails, scrofula and warts. If you don't believe it, read the advertisements.

As a wise man said, "You don't have to keep a bee to get stung." Just pay a stiff price for some oriental cream, or magic beautifier.—*Milwaukee Health Bulletin.*

*

Health Education.

Doctor Hurty, Indiana State Officer of Health, says, "the education of the people is a slow process. But," he adds, "the public education is a surer foundation for public health than lawmaking."—*Louisiana Quarterly Bulletin.*

Industrial Hygiene and Sanitation.

How Digestion Affects Output.—Hurried breakfasts or none at all on the part of employees mean less output from these people in the factory. This is one of the conclusions to be drawn from a report of Professor Kent of the University of Bristol, who was commissioned by the British government to study fatigue. Professor Kent's observations were made on 2,600 men and a large number of women. He found that between 36 and 37 per cent. of the workers examined had trouble with digestion. In several cases workers who produced far below the average were found to be coming to work without breakfast. A change of hours more favorable to a proper allowance for breakfasts increased output 12.4 per cent. Women workers are prone to underfeed themselves because they choose more delicacies to the exclusion of more substantial food.—*Factory,* July, 1917.

*

A By-Product From First Aid.—You are not making the most of your opportunities if you employ women nurses in the first aid department of your factory, providing most of your employees are men. A doctor would be better. This is the opinion of Dr. Otto P. Geier of the Cincinnati Milling Machine Company. He maintains that if a man comes to the first aid department and has a slight cut dressed by a nurse, he will not be inclined to tell any of his other troubles to her. With a man doctor, however, he will very likely feel perfectly free to speak of ailments which no doubt have been a means of preventing him from doing his best work. A little advice from the doctor may rectify the whole matter.—*Factory,* July, 1917.

*

Cooling the "First Aid" Room.—Usually after being injured, as the effect of the shock wears away, the workers begun to feel faint. Cool, fresh air aids materially in putting him on his feet. For this reason the "first aid" rooms at the James Manufacturing Company's plant are kept cooler than the remainder of the factory. During the summer months artificial cooling is necessary. The effect was decidedly beneficial. —*Factory,* July, 1917.

*

The American Museum of Safety has had so many calls, from time to time, for loan exhibits at technical schools, universities, conventions, expositions, and safety rallies of industrial plants, that the Trustees have felt it advisable to prepare traveling exhibits for educational purposes. The first of these exhibits is an illuminated rack for the display of lantern slides, holding approximately 150 slides. When knocked down, the entire exhibit fits into a neat shipping case, weighing approximately 200 pounds.

✣

Navy Safety Survey.—Mr. C. W. Price, Field Secretary of the National Safety Council, has entire supervision of a safety survey which is being made of the navy yards, arsenals, printing offices and other industries controlled by the federal government. The American Museum of Safety is coöperating in this work through its Director, Mr. A. H. Young, whose services were volunteered to the Standardization Committee of the United States Employees' Compensation Commission, and who has been appointed Safety Expert to take charge of the accident prevention work of the Middle Atlantic District.

✣

Framingham Safety Survey.—Active work on the industrial survey of Framingham, Mass., began May 8. Mr. Young of the American Museum of Safety spoke before an assembly of the manufacturer's, explaining the value of such a survey. The actual investigation of the industrial establishments was conducted by Mr. Albert S. Regula, a member of the staff of the Museum.. If possible, monthly meetings of all of the foremen will be held in order to educate them in the essentials of the "Safety First" movement.

✣

Alcohol Causes Wage Loss.—The United States Cast Iron Pipe & Foundary Company recently protested against the relicensing of Burlington, N. Y., saloons on the ground that the average loss of wages on account of drinking has been $180 per man during the last 11 months, and that the total wage loss for the city of Burlington could be conservatively estimated at $100,000 per year at least. The management arrived at those figures through a study of the record of 100 men, 50 of whom were average drinkers and the other 50 total abstainers. Injuries were more frequent among the drinking class.—*Safety Engineering*, July, 1917.

✣

Street Accidents on the Increase.—The number of accidents occurring in the streets of New York City show a decided increase, according to a report recently made public by Police Commissioner Arthur Woods. The report disclosed that the greatest number of accidents happen between noon and 8 o'clock at night. The only notable decrease shown is in horse-drawn traffic. —*Safety*, July-August.

✣

The Second Safety Congress for New York State will be held this year in Syracuse, N. Y., December 3 to 6.

✣

"Organizing and Conducting Safety Work in Mines," is the title of a richly illustrated bulletin issued by the United States Bureau of Mines. The purpose of the publication is to call attention to some of the means adopted for promoting greater safety in and around mines, in the hope that their presentation will stimulate activity and aid those endeavoring to solve safety problems in the different mining fields. An endeavor has been made to arrange these data in such a way as to present a system for practical application in either large or small mines be they coal or metal.

✣

The Successful Productions of Large Shells.—This article, appearing in the June number of *Industrial Management*, deals with the organization, equipment and management of the American Brake Shoe and Foundry Company at Erie, Pa. This plant has a larger capacity for producing 9.2-inch shells than any other shop in this country. Two British orders for a total of 570,000 large shells have been completed in this establishment. The article is based upon reports prepared by C. D. Pettis, vice-president and works manager of the company.

✣

Americanizing a Thousand Men.—L. D. Burlingam gives a description of a campaign for American citizenship, which was conducted among the alien employees of the Brown & Sharpe Mfg. Co., Providence, R. I. with most gratifying results. Out of 6,000 men, 1,312 were found to be non-citizens. Through methods described in the article, all but 206 have applied for the papers for which they were eligible. In these times of national emergency such a result is of more than passing importance.—*Industrial Management*, June, 1917.

Communication.

To the Editor:

I note in a recent issue of the American Journal of Public Health, the report of a health survey by Doctor Carol Fox of the United States Public Health Service of South Bend, Indiana.

I do not wish to criticize because I do not know what the local conditions at South Bend are, but on general principles, I doubt the wisdom of a recommendation advising a full time health officer at a salary of $2,500 a year for a city of over 60,000 people.

I believe in full time service but I do not believe in encouraging the idea that a competent, administrative officer for a modern health department in the city of South Bend can be secured for $2,500, unless, in addition to being a trained public health administrator, he is a professional philanthropist.

It seems to me it is high time to establish some reasonable standard of compensation for health work. The head of a health department of a community should be a man who compares favorably in professional and personal attainments with the best of the profession in that community and he should be entitled, at least, to the emoluments of the average member of the better class of practitioners. Advising full time health officers at salaries inadequate for high class men to live on is not going to advance the public health movement. At any rate that is the way it looks to me—and I think I am right.

With kind regards, I am,

Sincerely yours,

C. G. Parnall, M. D.

Jackson, Mich.

Personal Notes.

Members and subscribers enlisting in the Sanitary Service, or other war divisions, are respectfully requested to inform the Editor, for notice in these columns.

*

Dr. J. Bernard Nelson has recently been elected Secretary of the Arizona State Board of Health, succeeding Dr. R. N. Looney.

*

Dr. George Ruhland, Health Officer of Milwaukee, has been called into the war service.

*

The following District Health Officers have been appointed in California:

A. F. Gillihan, M. D., Santa Rosa, Cal., formerly lecturer at the Training School for Nurses at Berkeley, Cal., and at Oakland.

Harold Gray, B. S., M. S., Gr. P. H., Chico, Cal., formerly Assistant Health Officer, San Jose, Cal.

Robert N. Hoyt, S. B., San Jose, formerly Health Officer at Manchester, N. H.

Ralph W. Nauss, M. D., Dr. P. H., Fresno, formerly Epidemiologist, California State Board of Health.

E. D. Ward, M. D., Los Angeles, formerly Health Commissioner at Los Angeles.

E. A. Ingham, S. B., C. P. H. (Harvard-Technology), Riverside, Cal., formerly Agent of the Massachusetts Medical Society and lecturer at Massachusetts Institute of Technology and Tufts Medical College, Boston.

*

Dr. E. L. Godfrey has resigned as Director of the Bureau of Communicable Diseases of the Illinois State Health Department to become Sanitary Supervisor at the New York State Department of Health.

*

Dr. T. F. Abercrombie, formerly Health Commissioner of Glynn County, Georgia, has been elected to the position of Secretary of the Georgia State Board of Health. Doctor Abercrombie succeeds Dr. H. F. Harris, who has occupied the position of Secretary and Director of Laboratories since the Board was established. The Board elected Dr. Lovick T. Pattillo as Director of Laboratories.

*

Dr. H. H. Mitchell, Epidemiologist to the Indiana State Board of Health, has been commissioned as First Lieutenant in the Medical Reserve Corps.

The following were elected to membership in the American Public Health Association:

Wilfrid Sadler, Bacteriological Laboratory, MacDonald College, Quebec, Bacteriologist.

Ralph R. Morgan, B. S., Y. M. C. A., Petersburg, Va., Dairyman and Bacteriologist.

John Phillips Street, M. S., New Haven, Conn., Chemist.

Mrs. Sydney Williams, Wellesley, Mass.

Mr. Sanford C. Dinsmore, 223 University Terrace, Reno, Nev., Commissioner of Food and Drugs, State Chemist.

Alfred M. G. Soule, Department of Agriculture, State House, Augusta, Me., Chief, Bureau of Inspection.

Mr. Abel Todd, Lansing, Mich., Chemist.

William Levin, Dr. P. H., Ann Arbor, Mich., Assistant in Hygiene, University of Michigan.

Mr. J. D. Hackett, New York City, Industrial Counselor.

Mr. C. B. Hoover, Columbus, Ohio, Chemist.

Herbert J. Watson, P. D., Newark, Del., State Bacteriologist of Delaware with State Board of Health.

Charles N. Haskell, M. D., Bridgeport, Conn., Physician.

Robert M. Allen, New York City, Head of Food and Drug Control in Kentucky.

Ethan A. Gray, M. D., Chicago, Ill., Physician.

Mr. John Tombs, Albuquerque, N. Mex., Executive Secretary of The New Mexico Public Health Association.

Harry D. Garrett, Minneapolis, Minn., Food Inspector.

◆

Dr. J. F. Edwards of the Bureau of Infectious Diseases at Pittsburgh has been called into the War Service.

◆

Dr. B. W. Richards has been appointed Executive State Health Officer of Rhode Island, succeeding Dr. Gardner T. Swarts.

Books Received.

Women as Munition Workers. *Amy Hewes. Pp. 157. New York: Russell Sage Foundation, 1917. Cloth, 75 cents net.*

Preventive Medicine and Hygiene. *M. J. Rosenau, M. D. Third Edition containing a Special Section on Military Hygiene. Illustrated. New York: D. Appleton & Company; 1917. Pp. xxxiv+1374. Price, $6.50.*

Handbook of Health in War and Peace. *A Manual of Personal Preparedness. C.-E. A. Winslow. New York: American Museum of Natural History, 1917. Pp. 51. Paper, 25 cents.*

Hygiene and Public Health. *Louis C. Parkes, M. D., D. P. H. and Henry R. Kenwood, M. B., F. R. S., D. P. H. Sixth Edition, with illustrations. Philadelphia: P. Blakiston's Son & Company, 1917. Pp. xi+787. Cloth, $4.00.*

Current Public Health Literature.

AMERICAN.

American Food Journal.

August.

Alfalfa Flour a Possibility. Elizabeth C. Sprague.
Chemist Added to Mr. Hoover's Staff.
How to Make the Best Fly Poison.
Modern Methods of Water Purification By Chemical Treatment. Harry E. Barnard.
Recent Food Decisions of the Department of Agriculture.

The American Journal of Nursing.

XVII. August.

A Central School of Nursing and Public Health. Mary C. Wheeler, R. N., and Mrs. Ira Couch Wood.
Health Activities of a Civic Center in a Small Community. Elizabeth Ross.
A Health Center in a Large City. Robert H. Bishop, M. D.
Principles of Nursing Economy as Applied to Community Health Centers. William C. White, M. D.
Methods of Controlling Venereal Diseases. A. N. Thompson, M. D.
The Relation of the Graduate Nurse to the Problem of Social Hygiene. Mrs. William Falconer.

The Boston Medical and Surgical Journal.

CLXXVII. July 19.

A Comparison of Several Methods of Specific Early Treatment of Acute Anterior Poliomyelitis. Helmuth Ulrich, M. D.
Preparation of Animal Food Proteins for Anaphylactic Tests. R. P. Wodehouse and J. M. D. Olmsted.
A New Theory of Dreams.

CLXXVII. July 26.

Some Medical Practice among the New England Indians and Early Settlers. Carolus Cobb, M. D.
The Camp Idea in Tuberculosis.
The Economic Values of Life and Health.

CLXXVII. August 2.

When is the Diagnosis of Tuberculosis without Positive Sputum Justified? David R. Lyman, M. D.
Diagnosis of Tuberculosis in Children. Henry D. Chadwick, M. D. and Roy Morgan, M. D.
What Should Constitute Reportable Tuberculosis. Francis George Curtis, M. D.
Definitions and Diagnostic Standards in the Diagnosis of Pulmonary Tuberculosis in Adults. John B. Hawes, 2d, M. D.
Occupational Diseases in Massachusetts. Thomas F. Harrington, M. D.
The Diagnosis of Tuberculosis in Recruits.
Report of Committee on Social Insurance.

CLXXVII. August 9.

An Epidemic of Dysentery at the Boston State Hospital. Mary Elizabeth Morse, M. D. and Geneva Tryon, M. D.
A Year's Work with the Wassermann Test. Francis H. Slack, M. D. Philip Castleman, M. D. and Karl R. Bailey, M. D.

The Journal of the American Medical Association.

LXIX. July 21.

Results of the Recent Epidemic of Poliomyelitis in New York State. Henry L. K. Shaw, M. D.

July 28.

The Influence of War on Medical Science. James Ewing, M. D.
The Spread of Infection as a War Measure.
War Wastage: A Note of Warning to Examiners of Recruits. Sir William Osler.

August 4.

The Possible Application of the Macroscopic Slide Agglutination in the Search for Meningococcus Carriers. Charles Krumweide, Jr., M. D.
Standardization of Serums and Vaccines: Some Difficulties and Misunderstandings. G. W. McCoy.

August 11.

Problems Connected with the Collection and Production of Human Milk. B. Raymond Hoobler, M. D.

August 18.

Report of Studies Concerning Acute Lobar Pneumonia. Rufus Cole, M. D.
Occurrence of Tubercle Bacilli in Breast Milk of Tuberculous Women. Stanley L. Wang, M. D., and Frederick Coonley, M. D.

August 25.

The Importance of Diet as a Factor in the Production of Pathologic Changes. William Salant, M. D.
State Organization for Mental Hygiene. Owen Copp, M. D.
Mode of Infection, Means of Prevention and Specific Treatment of Epidemic Meningitis. Simon Flexner, M. D.

Medical Review of Reviews.

23. July.

The Pneumonias. Solomon Solis Cohen, M. D.
Birth Control—*Its General and Medical Aspects.* A. L. Goldwater, M. D.
The Bat as an Eradicator of the Mosquito. S. A. Campbell, M. D.
The Physician and the Alcoholic Question. T. D. Crothers, M. D.

23. August.

The Hygiene of Pregnancy. William C. Heussy.

The Military Surgeon.

XL. June.

The Diagnosis of Tuberculosis in The Military Service. Col. Geo. E. Bushnell, M. C., U. S. Army.
The Sanitary Service of the Austro-Hungarian Army in Campaign. Lieut. Col. Jos. H. Ford, M. C., U. S. A. (Military Observer).
An Epidemiological Study of Measles Outbreak at Camp Wilson, Texas, 1916. Lieut. Col. E. L. Munson, M. C., U. S. Army.
The Mobilization of the Troops of Illinois. Lieut. Col. Jacob Frank, Surgeon General, Ill.
Effects of Submarine Duty on Personnel. Asst. Surgeon Walter W. Cress, U. S. N.
The Administrative Technique of Antityphoid Inoculations. Maj. John H. Allen, M. C., U. S. Army.

The Modern Hospital.

VIII. July.

The Institutional Care of Epileptics. William T. Shanahan.
State Care for the Feeble-Minded. J. M. Murdock, M. D.
Flavoring Extracts, Their Character and Composition. John Phillips Street.
Institutional Economies for War Time.
The Institutional Life of the Moron.
Colonization of Social Misfits in New York State.
New Jersey Colonies for the Feeble-Minded.
The Feeble-Minded in Court.

VIII. August.

The Tuberculosis Campaign in New York State and Elsewhere.
A Survey of Nursing Resources.
A Sex Hygiene Exhibit for Recruits.
Light and Its Effect on Health.

New Orleans Medical and Surgical Journal.

CXX. August.

Placarding for Measles.
Practical Methods of Preventing Diseases in Communities, With Results Accomplished in Shreveport. Dr. G. C. Chandler.
The Laboratory a Contributory Aid in the Care of Pneumonia. Dr. J. C. Cole.
The Importance of Early Diagnosis in Mental Disorders. Dr. R. M. Van Wart.

New York Medical Journal.

CVI. July 28.

The Clinical Significance of Gastrointestinal Toxemias. E. E. Smith, Ph. D., M. D.
Race Betterment Based upon Principles of Physical and Mental Prophylaxis. Alfred Gordon, M. D.
The Field Hospital (*With Six Illustrations*). William W. Reno, A. M., M. D.
The Medical Officer in Action.
Prison Reform and Social Health or Disease.
Drug Resistance in Syphilis.

CVI. August 4.

The Primitive Medicine Man's Virtues. Jonathan Wright, M. D.
The Campaign for Pure Food. Harvey W. Wiley, M. D.
Serum Therapy as Applied. Louis Lehrfeld, M. D.
The Lobar Pneumonia Problem in the Army. Henry J. Nichols, M. D.
Exemption for Medical Students and Doctors.

CVI. August 11.

Diagnosis of Early Cancer of the Stomach. Anthony Bassler, M. D.
Diagnostic Teeth. Percy Willard Roberts, M. D.

CVI. August 18.

A Paraffin Wax Treatment for Burns. Charles A. Behney, A. B., M. D.
Etiology and Treatment of Bronchial Asthma. Mark J. Gottlieb, M. D.

The Nurse.

VI. August.

A Man and His Arteries. William Brady, M. D.
The Care of the Feet. A. W. Herr, M. D.
Warning against Canning Compounds.
Health and Motion Pictures. Ernest A. Dench.

The Public Health Journal.

VIII. July.

Variola. J. B. Boyle.
State-wide Education in Social Hygiene. Wm. T. Foster.
The Rochester Bureau of Health Consultation. George W. Goler.
The Illegitimate Child. J. J. Kelso.
Some Observations on Scarlet Fever. J. C. Hutchison.
Scavenging. Douglas Little.

Safety Engineering.

XXXIII. June.

The Accident Prevention Problem in the Small Shop. Earl B. Morgan.
Injurious Effects of Dust.
Humidity—Heat and Accidents. H. E. Ingram, M. D.
Hygiene, Sanitation and Physical Examinations. William J. Ezickson, A. B., M. D.
Community Health and Tuberculosis Conference Demonstration. Lee K. Frankel, Ph. D.

XXXIII. July.

Safety Standards for Industrial Ladders—Tentative Draft of a Code Presented by a Committee of the American Society of Mechanical Engineers. Prepared by William A. Viall.
Carbon Monoxide Poisoning.
Prize Essays on "Safety First."

Social Hygiene.

III. July.

A Study of Venereal Prophylaxis in the Navy. Charles E. Riggs.
What Is Chicago Doing for the Venereally Diseased?

Southern Medical Journal.

X. August.

The Etiology of Poliomyelitis. Horace Greeley.

Texas State Journal of Medicine.

XIII. July.

Collection of Vital Statistics in the Smaller Cities. L. Kaffie.

BRITISH.

Journal of State Medicine.

XXV. July.

On the Choice of Food in War Time. Professor F. G. Hopkins, M. B., D. Sc., F. R. S.
The Protection of the Health of Munition Workers. Edgar L. Collis, M. B.

The Medical Officer.

XVIII. July 7.

Special Article: The Duty of Health Departments on the Alcohol Question. Haven Emerson, M. D.
National Council for Combating Venereal Disease.

XVIII. July 14.

Editorial: National Care of Maternity.
Special Article: Cancer and the Public Health. Francis Carter Wood, M. D.

XVIII. July 28.

Editorial: Anthrax from Shaving Brushes.
Special Article: Meat Inspection in Rural Districts. William G. Savage, M. D., B. Sc., D. P. H.
The Campaign against Venereal Diseases.
Industrial Fatigue.
Bread Economy.
War Bread.

The Medical Officer.

XVII. June 2.

The Health Education of the General Public. W. C. Rucker.

XVII. May 19.

The House-Fly. H. Maxwell-Lefroy.

XVII. June 16.

Public Health and Control of the Liquor Traffic. Editorial.
Tests of Binet and Simon. John Priestley.

XVII. June 23.

L. G. B. Report on Maternity and Child Welfare. Editorial.
The Work of the Meningitis Division of the New York City Health Department. Josephine B. Neal.

American Journal of Public Health
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THE RED CROSS AND RELIEF IN CIVILIAN COMMUNITIES.

FRED R. JOHNSON,
Secretary, Committee on Civilian Relief, Metropolitan Chapter of the American Red Cross.

Read before the Massachusetts Association of Boards of Health, July 26, 1917.

IN A discussion of its work it is well to bear in mind the nature of Red Cross organization. This society is organized not on state lines, but by chapters. There are a number of these in Massachusetts. Thus, the Metropolitan Chapter includes Boston and surrounding towns. Essex County has one; Worcester, Lynn, and other cities have others. Since the outbreak of the war with Germany the number of chapters has multiplied with great rapidity.

It is inevitable that with a multiplicity of chapters, some on the county plan, some on the city plan, some in rural districts, and others in urban communities, there should be a variation of function in so far as civilian relief is concerned. For the purposes of this discussion it will consequently be necessary for me to discuss the work of the Civilian Relief Committee of the Metropolitan Chapter of the Red Cross.

Our committee is concerned with two main tasks. The first of these is the relief of families of soldiers and sailors who have been called to the colors. The second deals with relief work in disasters.

It is proper that the federal government and the Commonwealth of Massachusetts should make most of the financial provision for families when men enlist for war or are drafted for war service. The responsibility is of a public character. Were not the men in the army they would receive more pay and with certain exceptions be better able to care for their families. This theory has been followed. When hostilities seemed likely, Massachusetts quickly provided that in addition to the amount received from the federal government each enlisted man of the Massachusetts quota should be paid $10 a month. In addition an amount not to exceed $40 might be provided as relief for dependent families out of the state funds. Since the commonwealth took this action the federal government has raised the regular pay of privates to $30 a month. Accordingly federal pay, plus state pay, plus the maximum granted under the state allowance in Massachusetts may total $80 a month given to men of the ranks and their families if in need.

Since the basic relief is provided by the federal and state governments it may be asked what is the function of the Red Cross with reference to these families. We have found it to be threefold:

1. The Red Cross has assisted in making provision for dependent families of men in the regular army and navy who do not belong to the Massachusetts quota, and consequently are not entitled to provision made by the state.

2. The Red Cross steps in when, through necessary delays in official machinery, state grants are not available.

3. The Red Cross helps to provide friendly service of all sorts. This is, perhaps, its most important function.

Let me briefly outline some of the friendly tasks which the Red Cross is called upon to perform.

When the father, son, or brother is called away it often means the removal of the one who has been relied upon for counsel in regard to business matters. The wife or mother may be almost helpless. She needs some one to counsel with her concerning problems which arise. If there are no children she may desire to go to work and asks for help in securing suitable employment. Frequently there is illness in the home and the Red Cross is relied upon to assist in securing medical attention. There may be legal tangles on which advice is needed, and there is often a sense of loneliness to be overcome added to the mental stress which is inevitable when the husband, son or father is enlisted for war service.

These are but some of the tasks which come to the workers in civilian relief in their daily contact with families in addition to the provision of money for relief.

The second function with which our committee has concerned itself is that of disaster relief. Those of us who live in Massachusetts well remember the tremendous fires at Chelsea and Salem. We know that the wooden three-decker construction in Boston and some of the cities in the surrounding territory invite similar conflagrations at this time. To these dangers, present both in peace and war, are added the perils resulting from the rapid development of munition factories in some of our centers of population. I believe that even the most optimistic among us will share the belief that a disaster is not wholly improbable and that we should be ready when it comes.

Several members of our committee on civilian relief had experience not only in relief work following the Chelsea and Salem fires, but also at the time of the disaster in San Francisco. They were keenly conscious of our lack of organization and preparation to care for the suffering resulting from these catastrophes. Accordingly, an organization has been developed ready to spring into existence at once when the relief of a large group of our population becomes necessary. Committees on purchase of supplies, immediate food, shelter, and rehabilitation have been appointed, ready to take up their work with a general plan of action outlined and a squad ready for emergency action has been enlisted.

Just a word in regard to the relationship of our Committee on Civilian Relief to the Massachusetts State Department of Health. One of the men of that department is a member of our committee. It has been the purpose of the Metropolitan Chapter of the Red Cross to work in hearty coöperation with the State Department of Health should a catastrophe occur, well realizing that with an efficient state department, measures of sanitation and medical relief can best be developed under the jurisdiction of that department.

May I, in conclusion, stress the necessity of coöperation between different sections of the state. If a disaster should occur, shall we say in Essex County, the help of the Metropolitan Chapter might be necessary. On the other hand, should the disaster occur in Boston, or its suburbs, we would welcome the help of other Red Cross chapters throughout the state. The New England Division of the Red Cross has sent out a circular letter calling to the attention of the different chapters the necessity of following such a plan of coöperation and interaction to which there has been a cordial response.

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A SIMPLE MEDIUM FOR THE RAPID DIFFERENTIATION OF TYPHOID AND PARATYPHOID BACILLI.

I. J. Kligler.

(Abstract.)

THE concentration of large bodies of men always involves the danger of the spread of infectious diseases. Epidemics of intestinal diseases, such as typhoid, paratyphoid and dysentery, are usually most prevalent. This has been the experience of the European armies, while among our own men at the Border and in the concentration camps an epidemic of paratyphoid has been reported. Under such circumstances it is, of course, important that the nature of the disease be promptly diagnosed so that proper measures be taken to treat as well as check the spread of the disease. This is not always possible in the best field laboratory where the materials are few and the facilities for rapid diagnosis limited.

This paper discusses a new simple medium, readily prepared from cheap and easily obtainable ingredients. This medium has proven satisfactory for the differentiation of bacilli causing typhoid, paratyphoid A, paratyphoid B and dysentery, respectively. If cultures are made from blood a diagnosis can be made in eighteen to twenty-four hours. When the stool is used results can be obtained in forty-eight hours. This medium is a modification of one reported to have been used successfully in a French field hospital by *Burnet* and *Weissenbach*. It consists of a 0.5 per cent. nutrient agar containing 0.05—0.1 per cent. lead acetate and 0.2 per cent. glucose.

B. typhi produces *browning without gas.*

B. paratyphi B. produces *browning with gas.*

B. paratyphi A. produces *no browning but produces gas.*

B. dysentery produces *no browning and no gas.*

A LARGE CONCENTRATION CAMP IN ITS RELATION TO A CIVILIAN COMMUNITY.

Charles E. Simpson, M. D.,
District Health Officer, Massachusetts State Department of Health.

Read before the Massachusetts Association of Boards of Health, July 24, 1917.

A COUNTRY with but a small standing army, not given to military training, accustomed to concentration camps of only a few companies, or at the most, a single regiment, at its annual two-weeks muster, a sort of military picnic, suddenly finds itself in a state of war, where many nations with millions of well-trained men, equipped to the minute, are struggling against other nations, with their millions in well-trained and equipped armies.

It is true that for three years societies and organizations in the United States (for it is of that nation that I am speaking), had been collecting and spending large sums of money, and giving much thought and time, in a sort of charitable way, to the sufferers in the various pursuits of life among the combating nations. But this was not our own war, and it is some question whether the kind of organization for that work was of any real value when it came to organizing for our own need; or whether, like the formaldehyde fumigation, it gave us a false feeling that we were secure and well prepared for certain phases of the conflict.

As soon as the proclamation was made by the President, declaring that a state of war existed, the problem became acute for ways and means of organizing an effective army from the material on hand. The regulars would need but short training, and they were quickly shipped abroad to be taught the methods of present warfare near the firing line. The problem was harder for the National Guard, and more particularly for the raw recruits that were to be selected by draft, and as quickly as possible put into condition for effective warfare.

As soon as it was reasonably decided that there was to be a concentration camp in Massachusetts, Dr. Allan J. McLaughlin, the Commissioner of Health for Massachusetts, being a veteran in the federal public health service, and having had much experience around military camps, realized that we were to be confronted by a serious problem. As soon as he was satisfied that a camp for thirty thousand soldiers was to be established in the vicinity of Ayer, he appointed a committee of three district health officers to study the situation and make a report.

Their report showed that the towns in which the camp is located, together with those adjoining, are Ayer, Littleton, Harvard, Lancaster, Shirley, Townsend, Groton, and Pepperell; having a population, according to the 1910 census, of from 1,039 to 2,955, aggregating 16,534. During the next five years they gained in population but 397, none of them making any marked increase in population, and some actually falling off in the five-year period. These towns are as well organized for the preservation of health as the average Massachusetts town of their size. They have the usual sanitary conditions, consisting of little else than a good water supply; Harvard and Townsend being the only ones without a public supply for the thickly settled districts. None of them have a public sewer system; consequently most of them at times have cesspool, drainage, and privy nuisances; but few have efficient milk inspectors. All have inspectors of slaughtering, and no inspectors of provisions. All have medical inspection of schools, but not of an intensive character. Ayer, Lancaster and Pepperell have public health or district nurses, including school nursing; while Groton and Shirley have plans nearly perfected for employing similar workers. Ayer, Havard, Shirley, Groton, Lancaster, and Littleton have separate Boards of Health; while Townsend and Pepperell selectmen act also in health matters. All were doing reasonably good health work for normal conditions; while none had the organization or experienced workers that would be necessary to handle the conditions that would probably be created by such a camp. Even though they did have such organization and personnel, it also seemed clear that this was not a condition for each town to grapple with individually, but rather where uniform rules and regulations, as well as enforcement of them, were demanded, in order that one town might not receive all the influx of good population, and another permit the bad by greater leniency. That town lines must in some way be broken over so that the community could act as a unit was evident. This was readily recognized by the town boards of health, and, as is usual when they meet some extraordinary piece of work, some of them had already sought the advice of the State District Health Officer, and through him the State Health Department. Others quickly recognized the advisability of such action, and fell into line with the former. This was the more readily brought about through the policy of the State Health Department and the district health officers for the past ten years.

As the laws of Massachusetts place the enforcement of health and police regulations largely in the hands of local authorities, this had to be considered in whatever community organization was formed.

While there seemed to be no valid reason why the town officers should not do their part with both time and thought (and it is only just to these officers and the citizens at large to say they showed unusual willingness to coöperate and do what they could without too much overlapping and diversity of purpose); it did not seem right that they should be asked to shoulder the extra expense that would be incurred by extraordinary conditions brought about by the federal government.

To meet this emergency the Commissioner of Health of Massachusetts on May 21 addressed a communication upon the subject to the governor. Upon receiving this communication, the governor, on the same day, submitted a special message to the legislature, which thereupon passed a special act which took effect on its approval on May 25. This act carried an appropriation of $20,000 to be expended by the Commissioner of Health, with the approval of the governor and council, and $10,000 for the District Police.

The problems commenced with the construction camp. It is a large undertaking to make permanent quarters for thirty thousand men, a community approaching in size the cities of Waltham or Fitchburg, in a period of less than three months, and to have the perfect sanitary condition that is necessary for the modern military camp.

Provision had to be made for a safe and desirable water supply of about four million gallons a day; as well as for the disposal of sewage from this large body of men. A board of expert engineers, one representing the State Health Department, studied the question and decided that sufficient supply of good water could be had by enlarging the Ayer station, and that the contour and character of the soil was such that a system of sand filters for the sewage was available, and preferable to any other. Land was leased by the government, and the contract was let to a firm that was accustomed to handling large operations.

In order that the soil might be left unpolluted for the soldiers when they occupied their barracks, it was essential that strict sanitary regulations among the workmen should be enforced. An officer from the regular army medical corps was detailed to look after the sanitation throughout the camp, and has been working in perfect coöperation with the State Health Department. All latrines were made deep and fly-proof, and were burned out with hay and crude oil twice a week. All kitchen refuse was carefully and quickly collected after each meal, and burned in extemporized incinerators. All cans that had contained food products were also burned clean of any residue in the incinerators and then thrown into a large hole in the ground, later to be covered. Anyone, in any part of the camp, found polluting the soil was summarily discharged. What few horses were on the grounds were kept a long distance from the quarters for the workmen, and the manure was either hauled away by the farmers or burned each day.

Among the three to five thousand workmen on such a project there would necessarily be some accidents and surgical work to be looked after. In order that time would not be lost, as well as adequate surgical attendance be at hand, a small accident hospital was established on the grounds, and the insurance company has furnished physicians in weekly shifts. All kitchen help and food handlers have been tested for typhoid carriers to make sure that no infection might be started among the laborers.

Of this large number of laborers many came from the surrounding towns where they were able to return to their homes at night. Those remaining have caused very little difference in the conditions in the towns.

Laboratory accommodations, both for bacteriological work and water analysis, have been furnished by the state department.

There will be two distinct problems: one, the care of the soldiers and their activities inside the camp; and the other the care of the civilian population outside the camp. That inside the camp will naturally be cared for by the regular army service, together with what organizations they may deem serviceable from physical or mental viewpoints. That outside the camp will naturally fall to the care of the state and local authorities. There will not only be the population at present in the surrounding towns, but a large influx drawn for various business purposes to the immediate vicinity of the camp; most, with good intentions; some, as is usual in all quick-growing and sensational influx of population for any purpose, with not so good designs. The Secretary of War has declared a zone around the concentration camps, but not to extend over one-half mile into any incorporated city or town. As all the cities and towns in Massachusetts are incorporated, this zone will extend but one-half mile beyond the leased land of the government.

The lines of most intensive work would seem to be:

Sanitation;

Detection and care of communicable diseases;

Inspection of milk and other articles of food;

Venereal diseases; prevention, and also diagnosis and treatment;

Liquor traffic;

Care of injuries;

Care of the sick and needy.

SANITATION.

The first object of this cantonment is to turn out soldiers in the best physical condition for their work at the front in the shortest possible time. As it has been most thoroughly proven that sanitary conditions as nearly perfect as possible must be maintained inside a military camp if the health of the soldier is to be safeguarded so should it appeal to the people living near the camp that the greatest service they can render the soldier is to take extraordinary sanitary precautions themselves, in coöperation with the camp authorities. One of the common indices of good sanitation is scarcity of flies, and when nothing is left around in which flies can breed you are making a long stride toward ideal sanitation. Privies that are poorly constructed and freely accessible to flies should be put in good repair and made fly-proof. Swill and other refuse that has been carelessly put into dumps or allowed to stand about in the yards or hen-pens should be scrupulously cared for.

COMMUNICABLE DISEASES.

The soldiers will be immunized for typhoid and para-typhoid, but that will not prevent their being carriers. Epidemic cerebrospinal meningitis and pneumonia are generally considered diseases that accompany crowded conditions as in camps. The former has shown some tendency to be on the increase in Massachusetts, and some other parts of the United States. If it should occur at the camp or its vicinity it may be necessary to institute a search for carriers.

The minor diseases have been found

rather serious in concentration camps, measles in particular finding many victims, and carrying a high mortality rate. Unusual precautions must be taken in detecting and caring for these minor ailments. This should be done by householders being on the alert to either report all cases or call a physician; by the activity of the public health nurse; and by intensive school inspection and follow-up of absentees. Careful quarantine regulations must be enforced, and it may become necessary to take some building for a hospital for contagious diseases.

FOOD INSPECTION.

Competent inspection of dairy farms, milk, and articles of food on sale must be provided for.

VENEREAL DISEASES.

Precautions must be taken by the police authorities, as well as careful teaching by nurses; and the providing of innocent entertainment by organized societies. In spite of this, trouble may be looked for from prostitutes with headquarters in the vicinity, as groups of women in road-houses; from prostitutes in lodging houses or other permanent quarters, and from prostitutes coming in from surrounding cities with clandestine intentions. The too friendly or sympathetic woman will also need attention. Some provision must be furnished for the detection and treatment of venereal trouble, more particularly in this latter group, but if found necessary, in all.

LIQUOR TRAFFIC.

The abuse of liquor must be guarded against from the licensed places, the unlicensed and hip-pocket barrooms in the vicinity that are selling illegally, and from camp loungers who may be used as messengers to purchase and bring in liquor.

The licensed cities and towns within comparatively easy reach of the camp are the town of Pepperell, eight miles away, with two railroad lines; Clinton, twelve miles away, with one direct railroad line; Gardner, twenty-four miles away, with a direct railroad line; and Lowell, eighteen miles, with a steam and trolley line. Express trains reach Boston in about one hour. These places can all be reached quickly by automobile over good state roads.

CARE OF INJURIES.

Some dispensary should be established for first-aid work, and minor injuries and cases of sickness, on account of the ordinary hazards, extra risks from congested highways, and from the increased building activities.

CARE OF THE SICK.

The community is even now not crowded with doctors, and of the four doctors at present in Ayer one is enlisted and will probably go to the front. With the large influx of people it is not likely that there will be an equal influx of physicians, when so many are being taken into military service. While most of the people in this community now are well housed, and living with their families, they do not particularly feel the need of hospitals; but it will not be found so easy to look after those who are taken sick out of the large number that are coming in, many without regular homes, and probably without their families; many of these will require hospital accommodations. At present there are two small hospitals in Groton, some four or five miles away; and the next nearest are Fitchburg and Clinton, about twelve miles away. This is rather far to move a very sick case, and some provision should be made for meeting such emergencies.

The state boards to look after these activities would naturally be the Department of Health, the District Police, the State Board of Charities, and the Commission on Mental Diseases.

There would seem to be considerable work that would naturally fall to the activities of the Red Cross; such as caring for the sick, and furnishing nurses to the dependents. Much can be done by the charitable and social organizations, and all will expect much assistance from the local committees on public safety. These have expressed a willingness to help, and I am sure will freely coöperate when shown what they should do.

When confronted by a common danger, we have "agglutinated," but to show that we are not "paralyzed," a community council has been formed in the towns most likely to be affected, consisting of executive officers of each local board of health. Rules and regulations have been drawn up, approved by all, and are about to be legally adopted. A similar organization of the executive officers of the town selectmen has been formed, to consider uniform building by-laws and police regulations, and the heads of the various state departments mentioned have been in consultation, and are working in close coöperation. Headquarters for the State Department of Health have been secured in Ayer; the representatives of the other state departments will be furnished the necessary quarters with them, as will other official and semi-official organizations as far as possible. In thus grouping, we hope to be able to obtain still closer coöperation in the work. Good relations have been established with the army officers, that the federal and state officers may each be conversant with the activities of the other. Arrangements have been made with the Food and Drug Department to detail one of their chemists, and establish a laboratory at the Ayer headquarters. He will act as Inspector of Milk, as well as for Food and Drugs, with the assistance of the local officers in the community. An office force has been employed, and nurses have been consulted with, to supplement the work of the nurses already in the field, and who will be put to work in a few days. A comprehensive set of questions has been made out for a sanitary and social survey of the entire district, and work on this has already started. The state police have carefully looked the ground over, and have formulated plans for action.

While the task is a large and unusual one, we believe with the hearty coöperation that is manifest by all, it will be carried to a successful finish; and each official and individual will faithfully carry through the work assigned to him for the development of this division of the army, and to make Ayer and the surrounding towns larger and better places on account of the establishment of Camp Devens in their midst.

INQUIRY BLANK.

Town of ———; Street or Road; Map number; Name of head of household; Owner of place.

For each member of household: Name, Age, Occupation, Place of occupation, Date of successful vaccination; What communicable diseases in the household in the past year, and date? Are all members of the household well at present?

Of what material are buildings built? State of repair? Water supply from well? Faucet from public supply? From private supply? Privy or cesspool? Condition and position in relation to house and water supply?

If producing foodstuff in excess of home use, what and where sold? Number of rooms in the house? What rooms could be let and rates a day? a week? Would meals be furnished? Rate? How many enlisted men would you be willing to entertain at your house for a day? For an evening meal? How often?

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MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH.*

THE regular quarterly meeting of the Massachusetts Association of Boards of Health was held at the Pemberton Inn, Hull, Mass., on Thursday, July 26, 1917.

In the absence of the President, Dr. John S. Hitchcock, First Vice-President, took the chair.

It was voted to dispense with reading the minutes of the preceding meeting.

On recommendation of the Executive Committee the following applicants were admitted to membership in the Association: Dr. Charles H. Phillips, 221 Cabot St., Beverly, Mass.; Dr. Geo. T. O'Donnell, 768 Main St., Waltham, Mass.; Eugene S. Barry, Chairman, Board of Health, Ayer, Mass.

The following program was then presented:

"The Red Cross and Relief in Civilian Communities." Fred R. Johnson, Secretary of the Civilian Relief Committee of the Boston Metropolitan Chapter, American Red Cross.

"A Large Concentration Camp in Its Relation to a Civilian Community." Charles E. Simpson, M. D., District Health Officer, State Department of Health.

The meeting was adjourned.

F. H. SLACK, M. D.
Secretary.

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* The expense of publication of the minutes and papers of this meeting are borne by the M. A. B. H.

A GRAPHICAL STUDY OF THE EPIDEMIOLOGY OF POLIOMYELITIS.

T. G. Hull,

Department of Public Health, American Museum of Natural History, New York.

Received for publication February 4, 1917.

THE poliomyelitis epidemic of 1916 differed from previous outbreaks only in size; but the magnitude of the problem has stimulated investigation to an unprecedented degree. Most of the work on this disease, however, has been limited to the experimental studies of the laboratory, while the wealth of available epidemiological material remains almost untouched. The studies of the Massachusetts State Board of Health in earlier outbreaks and of the United States Public Health Service in the present one are brilliant exceptions. It seems likely that a detailed study from different viewpoints of the characteristics of poliomyelitis as it occurs in nature may throw important light upon the factors concerned in its causation. At the suggestion of Professor C.-E. A. Winslow, Curator of Public Health in the American Museum of Natural History, I have therefore undertaken such a study, which points clearly to the existence of three such factors, two of them well-known and a third, which has not so generally been recognized.

The results of this study can be presented best in graphic form with only brief necessary comment.

The Epidemic Spread of the Disease.

The 1916 outbreak offers excellent evidence of the existence of the first factor concerned in the spread of poliomyelitis, viz., communicability. The epidemic began in Brooklyn, from which locality it quickly spread to the remainder of New York City and to New Jersey, the largest number of cases being reported in each of these places for the week of August 12, followed one week later by Connecticut and New York State, and by Pennsylvania in the week of August 26. From the peak in each case there was a more or less rapid decline. (See charts published in American Journal of Public Health, 1917, Vol. VII, p. 118.)

The mapping of the cases as reported by months in different states indicates that the disease is a communicable one and must have been carried mainly by human agencies, since it followed the routes of travel. In Connecticut the epidemic was confined chiefly to the main railroad line between New York and Boston. The epidemic passed from New York City in the form of a great wave, the territory first infected clearing up first.

The wave-like character of the epidemic is shown still better where the cases per 100,000 population are given by counties, and the counties plotted according to their distances from Brooklyn. The crest of the wave progressed steadily across the state in New Jersey and also in New York. (See chart, AMERICAN JOURNAL OF PUBLIC HEALTH, 1917, Vol. VII, p. 119.)

It will be noticed that those counties more or less isolated from main routes of travel escaped with a very low incidence.

The fact that in the districts first affected (Brooklyn, the southeastern counties of New York and the northeastern counties of New Jersey) the diseases began to subside before it reached its maximum in the regions beyond strongly suggests the burning out of susceptible material in these communities and is in line with the view of Frost and others that in a severe outbreak of poliomyelitis practically the whole population is exposed to infection.

THE FACTOR OF SEASON.

A second fundamental factor in the prevalence of this disease is its marked preference for the summer season. This is a puzzling phenomenon since all other diseases spread as poliomyelitis is believed to be spread, by the exchange of nose and throat secretions by human contact, are cold weather diseases. Professor Winslow has pointed out that a summer prevalence is suggestive of either an insect factor or an intestinal factor of some sort in the etiology of the disease.

The influence of season was very clearly shown in the 1916 epidemic. In the communities first affected the disease naturally decreased with the exhaustion of susceptible material; but even in the outlying districts where the epidemic broke out at a later date and could not have attained its maximum severity it dropped off in September with the onset of cool weather and practically disappeared in October. Chart 1, showing the incidence of the disease in five New Jersey counties, shows this very clearly. Essex and Passaic counties were severely affected early in August; Monmouth, not until late August; Atlantic and Gloucester counties, not until September; yet when cold weather came on the cases in the latter counties dropped off at once without ever reaching the maxima attained in the regions first attacked, and, apparently, before the available susceptible material could have been exhausted.

In order to see how far the principle of summer prevalence has held, I have studied the records of 52 epidemics, which have been reported during the past seventy-five years in different parts of the world. Chart 2 shows how generally the outbreaks have begun in the warmer months, though they have sometimes persisted through the fall. The detailed history of eleven typical epidemics is shown in Chart 3. The peak usually occurs in August or September with practically all the cases between the first of June and the last of November. A few small epidemics occurring in diferent localities have extended into the winter. In each one there is the usual summer rise and drop with a second rise in winter. The number of outbreaks and the number of cases in these outbreaks is so small in comparison with the others, however, that they do not materially affect the general conclusions brought out in Chart 3.

INFLUENCE OF RAINFALL.

The fact that epidemics of poliomyelitis often occur during dry seasons has been occasionally noted and was strongly emphasized by Hill in the case of the Minnesota epidemic of 1909. In the course of my studies my attention was drawn to the fact that August, 1916, had the lowest rainfall recorded for that month in 46 years. In order to see whether this relation was in any sense a general one I have studied thirty-four epidemics (see Table I), the results being summarized in Table II. It will be seen that 76 per cent. of the epidemics began in deficiency months and in 29 per cent. the dry weather continued clear through. Twenty-four per cent. of the epidemics began in excess months, but in no instance did the wet weather continue clear through.

Chart 4, selected from the large series of outbreaks plotted, show the conditions which have generally obtained, although there have been a few exceptional instances of epidemics during wet seasons. Chart 5 brings out the broad relation between rainfall and the incidence in the epidemics for which full data were available.

TABLE I.

Locality and Year.	*Cases.*	*Month.*	*Precipitation.*		
			(mm.).	Departure from normal.	
Stockholm, 1887,		Aug.	44.	−29.	+
		Sept.	60.		18.
			(*in.*)		
Poughkeepsie, N. Y., 1899,		July	5.56		1.29
		Aug.	1.68	2.93	
North Adams, Mass., 1894,		Aug.	6.09		1.7
		Sept.	2.20	.8	
			(mm.)		
Stockholm, 1895,		June	25.	14.	
		July	114.		51.
		Aug.	72.	1.	
		Sept.	41.	1.	
Trondhjem, Norway, 1905,		Apr.	53.		10.
		May	36.		
		June	47.		6.
		July	117.		52.
		Aug.	116.		28.
		Sept.	55.	23.	
		Oct.	65.	28.	
Vienna, 1897,		June	79.	5.	
		July	206.		128.
		Aug.	39.	23.	
		Sept.	42.		
		Oct.	51.		
		Nov.	11.	21.	
Stockholm, 1899,		July	49.	14.	
		Aug.	23.	50.	
		Sept.	115.		73.
			(in.)		
Gloucester, Mass., 1900,		June	1.85	1.2	
		July	2.69	.8	
		Aug.	2.46	2.0	
		Sept.	4.62		1.7
Ridgeway, Pa., 1907,		July	1.32	3.69	
		Aug.	1.37	2.59	
		Sept.	5.55		2.16

Locality and Year.	*Cases.*	*Month.*	*Precipitation.*		
			(in.)	Departure from normal.	
New York, N. Y., 1907,		July	.89	−3.6	+
		Aug.	3.24	1.3	
		Sept.	8.33		4.6
		Oct.	4.78		.9
San Francisco, 1901,		May	.69	.1	
		June	.00	.2	
Cherryfield, Me., 1896,		July	6.05		3.0
		Aug.	2.90	.6	
New York, N. Y., 1897,		June	2.98	.3	
		July	9.52		5.0
			(mm.)		
Saint Foy, France, 1885,		June	21.	44.	
		July	9.	70.	
St. Girons, France, 1894,		July	4.	8.	
		Aug.	1.	25.	
Vermont, 1894,		July	1.57	1.2	
		Aug.	1.49	2.5	
		Sept.	2.88	.5	
			(mm.)		
Umea, Sweden, 1881,	18	July	55.4	1.5	
			(in.)		
Vermont, 1915,	9	Aug.	2.88	.9	
	13	Sept.	.97	3.0	
	10	Oct.	2.74	.5	
Newark, N. J., 1916,	197	July	3.44	1.1	
	503	Aug.	.59	4.0	
	89	Sept.	2.98	.6	
Franklin County, Mass., 1908,	6	June	2.7	.4	
	28	July	2.0	1.6	
	26	Aug.	3.7	.2	
	5	Sept.	.3	2.4	
Los Angeles, Cal., 1912,	19	June	0.0	.10	
	129	July	0.0	.02	
	89	Aug.	0.0	.03	
Vermont, 1914,	8	July	1.94	1.8	
	88	Aug.	2.78	1.2	
	142	Sept.	2.36	1.0	
	56	Oct.	1.10	2.1	
Boston, Mass., 1893,	8	Aug.	6.5		3.2
	11	Sept.	1.6	2.4	
Westfalen, 1909,	9	June	64.	4.	
	28	July	114.		24.
	57	Aug.	104.		21.
	75	Sept.	92.		32.
	147	Oct.	57.	10.	
	42	Nov.	72.		21.
			(in.)		
Seattle, Wash., 1910,	32	Aug.	.17	32.	
	32	Sept.	1.04	89.	
	15	Oct.	4.02		1.14
Buffalo, N. Y., 1912,	9	June	.83	2.31	
	68	July	1.41	1.99	
	110	Aug.	4.00		1.01
	74	Sept.	3.31		.13
	16	Oct.	4.25		.72
Mason City, Iowa, 1910,	5	May	2.32	2.34	
	14	June	1.20	4.69	
	17	July	.71	3.35	
	3	Aug.	4.84		1.24
Stockholm, 1911,	19	May	6.	29.	
	23	June	23.	16.	
	11	July	34.	29.	

Locality and Year.	*Cases.*	*Month.*	*Precipitation.*		
			(mm.)	Departure from normal.	
Stockholm, 1911—*Cont'd,*	24	Aug.	32.	−41.	+
	57	Sept.	40.	1.	
	32	Oct.	65.		6.
	17	Nov.	78.		39.
			(in.)		
Minnesota, 1909,	7	June	3.5	.7	
	26	July	3.84	.48	
	58	Aug.	4.54		1.15
	99	Sept.	3.16	.25	
	87	Oct.	1.56	.82	
	21	Nov.	2.68		1.83
	10	Dec.	1.54		.77
Cincinnati, Ohio,	5	Aug.	3.06	0.27	
	44	Sept.	7.52		5.21
	92	Oct.	4.54		2.22
	17	Nov.	2.92	.29	
			(mm.)		
Jönköping's Co., Sweden, 1911,	49	July	56.9		2.
	414	Aug.	39.9	40.	
	313	Sept.	29.2	15.	
	132	Oct.	95.7		55.
Älfborg's Co., Sweden, 1911,	34	July	45.8	24.	
	106	Aug.	37.5	78.	
	103	Sept.	53.9	7.	
	32	Oct.	139.4		42.
			(in.)		
Nebraska, 1909,	143	July	3.9		.4
	137	Aug.	2.0	1.	
	53	Sept.	2.9	.7	
	20	Oct.	1.1	.5	
New York, N. Y., 1916,	313	June	3.98		.68
	3443	July	3.44	1.1	
	3927	Aug.	.59	4.0	
	985	Sept.	2.98	.6	
	258	Oct.	.63	3.0	

TABLE II.

Total number of epidemics	34
Epidemics starting in deficiency months	26
Epidemics starting in excess months	8
Epidemics occurring entirely in deficiency months	10
Epidemics occurring entirely in excess months	0
Total number of months	123
Number of deficiency months	82
Number of excess months	38
Number of months with no change	3

Of these 34 epidemics only 18 were sufficiently well reported so that the number of cases by months could be determined. These 18 were studied as to the number of cases occurring in the deficiency and excess months.

TABLE III.

Total number of epidemics	18
Total number of months	73
Number of deficiency months	51
Number of excess months	22
Total number of cases reported	13,365
Cases occurring in deficiency months	11,994
Cases occurring in excess months	1,371

Although only 70 per cent. of the months were deficient in rainfall, 90 per cent. of all the cases occurred during dry seasons.

The relation between the number of cases and the amount of dryness is quite pronounced. In those months when the deficiency of rainfall amounted to 3 to 5 inches, 36 per cent.

of all the cases occurred, 1 to 3 inches deficiency—35 per cent. of the cases, 0 to 1 inch more than 17 per cent. of the cases.

SUMMARY.

From the charts, maps and tables given the following conclusions concerning past epidemics of poliomyelitis may be drawn:

(1) The disease follows the main routes of travel, indicating that it is probably carried by human agencies. (2) It spreads in waves over the country, the crest progressing steadily away from the focus. This suggests that in severe outbreaks practically everyone is exposed and, after all the susceptibles have been stricken, the epidemic subsides. (3) The seasonal prevalence is quite marked, the large majority of cases occurring between the first of June and the last of November. In the southern hemisphere the seasons are reversed, the epidemics occurring between the first of December and the last of May. (4) Out of 34 epidemics occurring during the last 75 years, 76 per cent. began in months of deficient rainfall and in 29 per cent. of them the dry weather lasted clear through. Twenty-four per cent. of the epidemics began in excess months and in none did the wet weather continue clear through.

In 18 epidemics with a total of 13,365 cases practically 90 per cent. of the cases occurred during deficiency months. The dryer the weather, the greater, in general, has been the number of cases.

BIBLIOGRAPHY.

BLACKHALL, P. 1904. Australasian Med. Gaz., p. 347.

BROWN. 1913. Calif. State. Med. Jour., v. XI, p. 26.

BUZZARD. 1898. Lancet, March 26.

CAVERLY, C. S. Jour. Am. Med. Assoc., v. XXVI, p. 1.

1914. Pub. Health Reports, October.

1916. Bull. Vermont State Bd. Health, v. XVI, No. 4, June 1.

COLLINS, J. 1908. Jour. Am. Med. Assoc., *50*, p. 1766.

1910. Jour. Am. Med. Assoc., *54*, p. 1925.

COLMER, GEO. 1843. Am. Jour. Med. Science, *5*, p. 248.

EMERSON, H. C. 1909. Bost. Med. & Surg. Jour., *161*, p. 115.

FREE, S. M. 1908. Jour. Nerv. & Ment. Dis., p. 259.

FROST, W. H. 1913. Hygienic Lab. Bull., 90.

GRIESVALD. 1906. Jahrb. f. Kinderh., *64*, p. 255.

HARBITZ. 1912. Jour. Am. Med. Assoc., Sept. 7.

HILL, H. W. 1910. Am. Med. Assoc., Paper read at 61st Annual Session, St. Louis.

HOLT, L. E. 1910. Am. Jour. Orth. Surg., *8*, p. 195.

HOLT AND BARTLETT. 1908. Am. Jour. Med. Science, *135*, p. 647.

KLING AND PETTERSSON AND WERNSTEDT. 1912. Special report to 15th International Congress, Washington.

KRAUSE, P. 1911. Die Therapie der Gegewart, *52*, p. 145.

LITCHFIELD, W. F. 1904. Australasian Med. Gaz., *23*, 346.

LOVETT, R. W. 1908. Bost. Med. & Surg. Jour., *159*, 131.

1909. Boston. Med. & Surg. Jour., *161*, 112.

McCLANAHAN. 1910. Jour. Am. Med. Assoc., October 1.

McKENZIE, D. H. 1902. Med. Record, *62*, 528.

NETTER, A. 1910. Séance, May 31.

1910. Bull. de l'Acad. de Méd., Ser. 3, v. LXIII, p. 458.

NEWMARK, L. 1899. Med. News. Phila., January 28.

Orbison, T. J. 1912. Calif. State Jour. Med., *10*, 402.

Orr, H. W. 1910. Am. Jour. Orth. Surg., *8*, 594.

Putnum and Taylor. 1893. Bost. Med. & Surg. Jour., *129*, 509.

Starr. 1908. Jour. Am. Med. Assoc., *51*, 112.

Stephen, H. D. 1909. Lancet, Apr. 3, p. 999.

Taylor, H. L. 1897. N. Y. Med. Jour., p. 192.

Wade, R. B. 1904. Australasian Med. Gaz., *23*, 344.

Wallace, C. 1907. Jour. Am. Med. Assoc., *49*, 2082.

Woods, A. M. Occidental Med. Times, *17*, 77.

Washington State Board of Health. Studies in Infantile Paralysis during 1910.

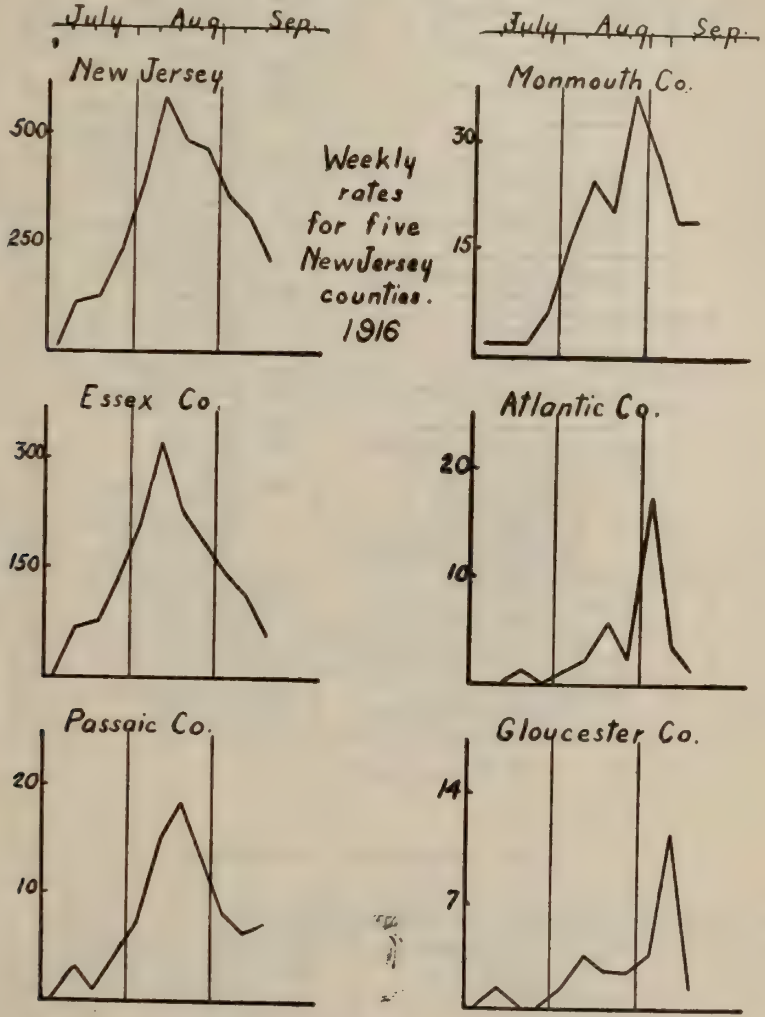
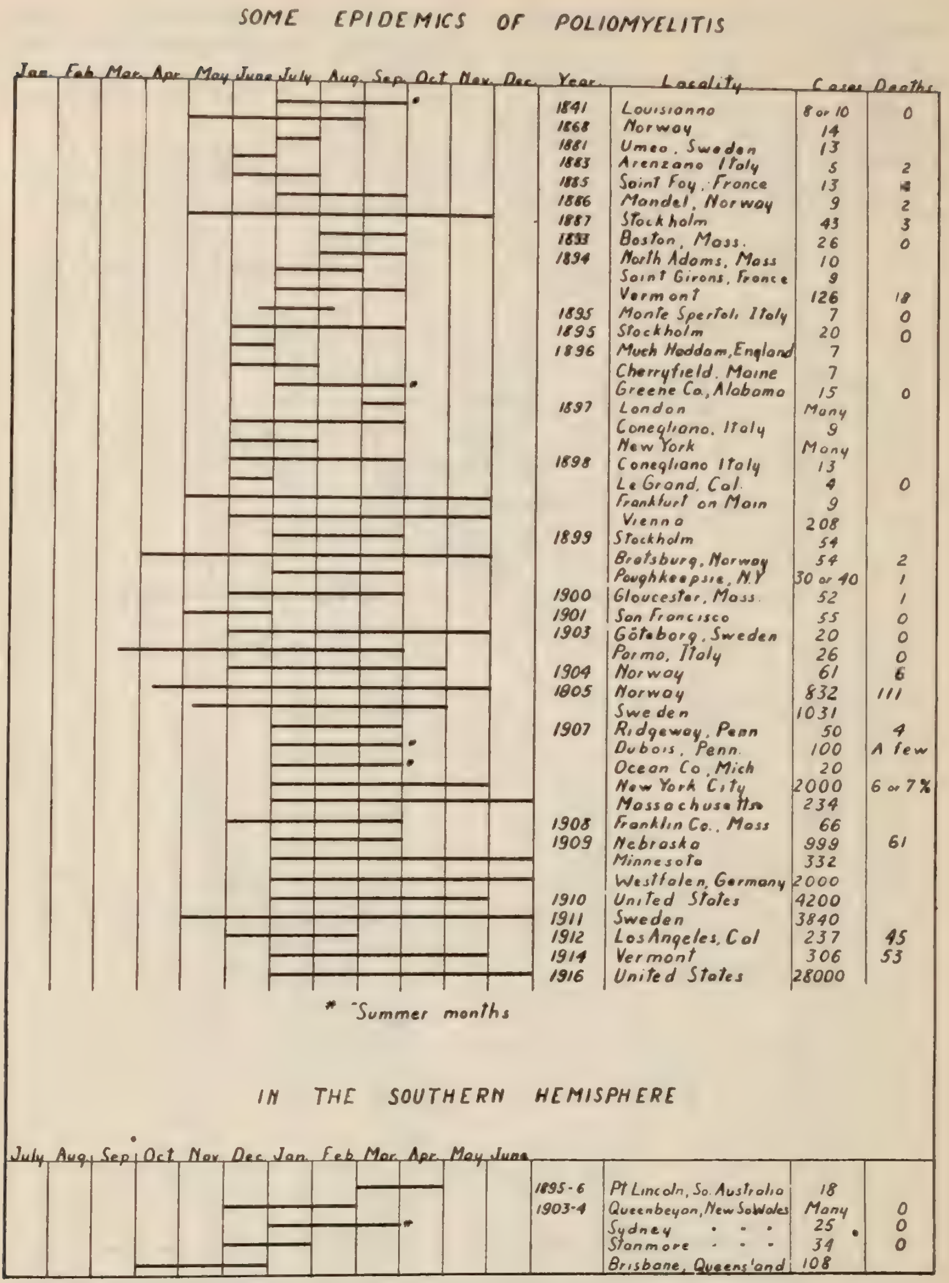


Chart 1. Weekly rates of poliomyelitis for five New Jersey counties, showing how the disease progressed in a wave across the state (Essex, Passaic, Monmouth, Atlantic, Gloucester), and the burning up of susceptible material. When cool weather came on, the epidemic subsided without reaching the maxima attained in the regions first attacked and apparently before all available susceptible material could have been exhausted.



Year.	Locality	Cases	Deaths
1841	Louisianno	8 or 10	0
1868	Norway	14	
1881	Umea, Sweden	13	
1883	Arenzano Italy	5	2
1885	Saint Foy, France	13	[illegible]
1886	Mandel, Norway	9	2
1887	Stockholm	43	3
1893	Boston, Mass.	26	0
1894	North Adams, Mass	10	
	Saint Girons, France	9	
	Vermont	126	18
1895	Monte Spertoli Italy	7	0
1895	Stockholm	20	0
1896	Much Haddam, England	7	
	Cherryfield, Maine	7	
	Greene Co, Alabama	15	0
1897	London	Many	
	Conegliano, Italy	9	
	New York	Many	
1898	Conegliano Italy	13	
	Le Grand, Cal.	4	0
	Frankfurt on Main	9	
	Vienna	208	
1899	Stockholm	54	
	Bratsburg, Norway	54	2
	Poughkeepsie, N.Y	30 or 40	1
1900	Gloucester, Mass.	52	1
1901	San Francisco	55	0
1903	Göteborg, Sweden	20	0
	Parma, Italy	26	0
1904	Norway	61	6
1805	Norway	832	111
	Sweden	1031	
1907	Ridgeway, Penn	50	4
	Dubois, Penn.	100	A few
	Ocean Co, Mich	20	
	New York City	2000	6 or 7%
	Massachusetts	234	
1908	Franklin Co., Mass	66	
1909	Nebraska	999	61
	Minnesota	332	
	Westfalen, Germany	2000	
1910	United States	4200	
1911	Sweden	3840	
1912	Los Angeles, Cal	237	45
1914	Vermont	306	53
1916	United States	28000	

IN THE SOUTHERN HEMISPHERE

1895-6	Pt Lincoln, So. Australia	18	
1903-4	Queenbeyan, New So Wales	Many	0
	Sydney " "	25	0
	Stanmore " "	34	0
	Brisbane, Queensland	108	

CHART 2. Records of fifty-two epidemics of poliomyelitis showing the prevalence in the warmer months.

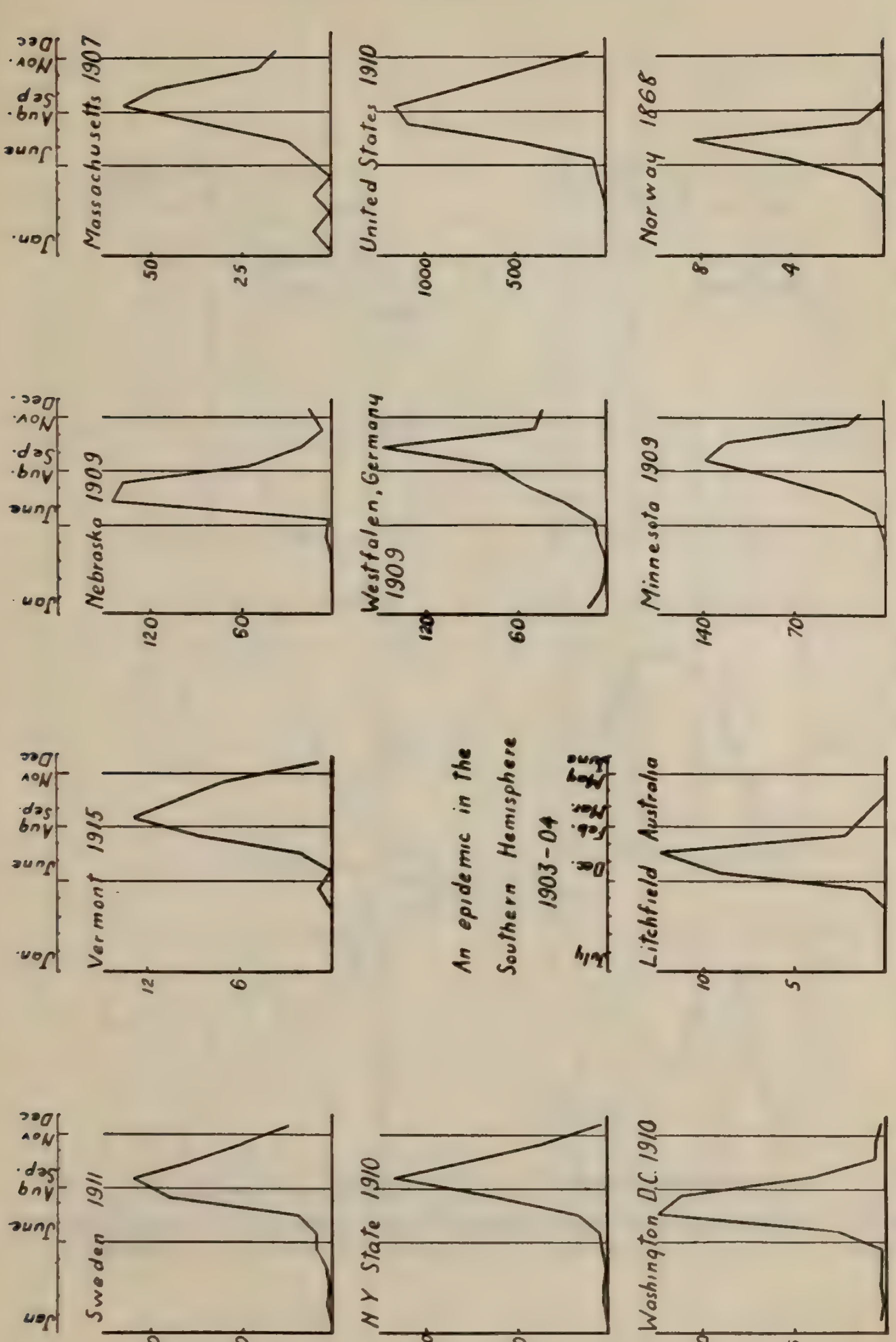


Chart 3. Detailed history of eleven typical outbreaks of poliomyelitis showing how the peak usually occurs in August or September, with all the cases between the first of June and last of November. (Southern Hemisphere first of December and last of May.)

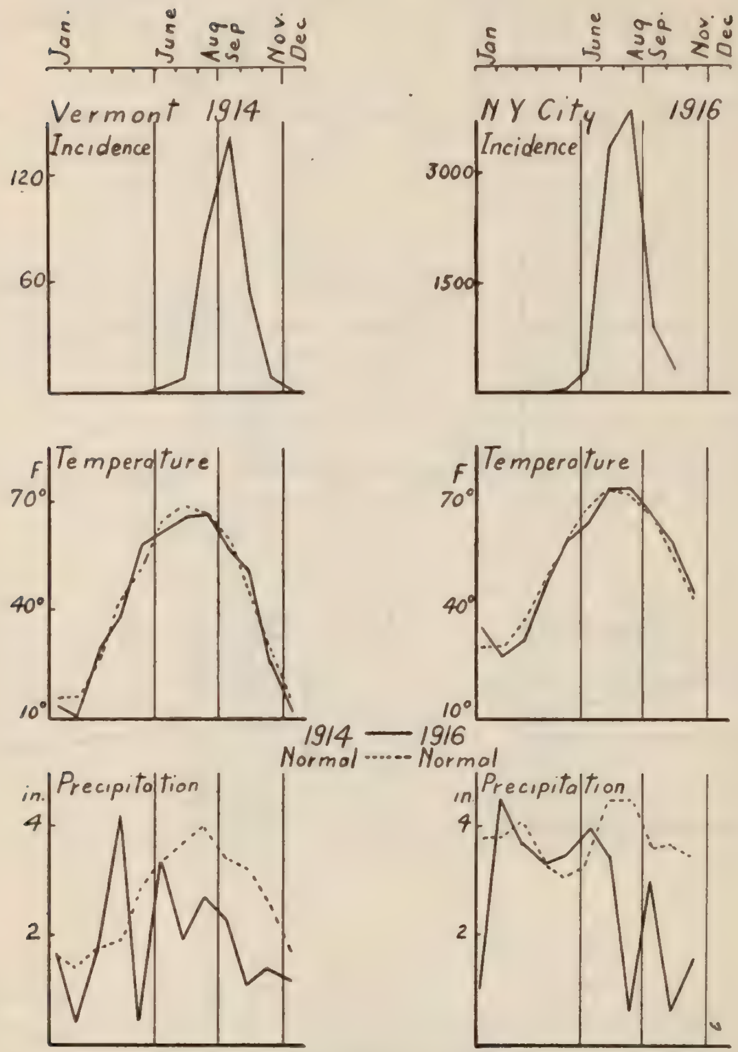


Chart 4. Relation of incidence of poliomyelitis to temperature and rainfall. Note the deficiency of rainfall during the height of the epidemics. This is typical of the large majority of epidemics.

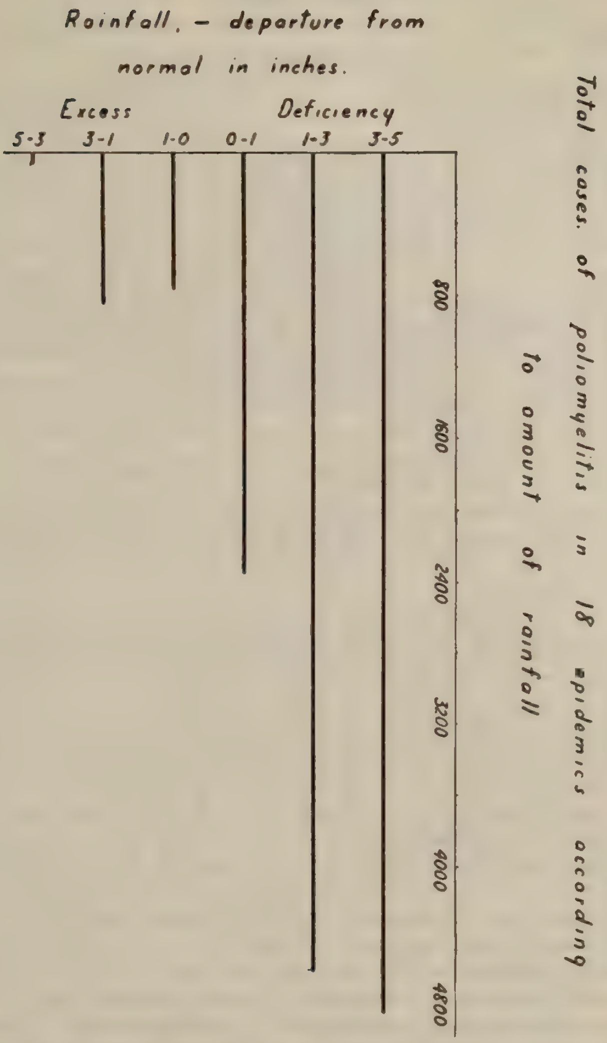


CHART 5. Relation between rainfall and incidence of poliomyelitis, showing how 11,994 cases or 90 per cent. of the total occurred during months of deficient rainfall, as against 1,371 cases in months of excess rainfall. In general, the dryer the weather in epidemics, the greater the number of cases.

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THE WAR MEETING AT WASHINGTON.

Astride of the ever extending realization by the people of the value of hygienic living has come the realization by all of the necessity of hygienic fighting, and the continued maintenance of the high standard of health of the civil population during the war period.

We have as a nation little personal experience of the application of the modern principles of public health practice to a concentrated armed force of hundreds of thousands. We have as a nation still less experience in the maintenance of a high standard of health among the civil population at home during war; a standard which cannot help but be undermined at first by unfortunate withdrawal of health supervision and short-sighted diminution of appropriation.

But we as a nation must offset our lack of experience and the slight, though certain—and thus dangerous—tendency towards the decrease of health supervision among the civil population.

The Forty-fifth Annual Meetings of the American Public Health Association are to take place at a time when the country is in peculiar need of education, of practical experience, and of constant and serious appreciation of what the country must have—health, at home and abroad.

What a splendid service to this country the American Public Health Association can render at this time: A congress of health workers, drawn together for a great and common purpose; a congress led by military and civil health authorities; a congress convened to learn and to afterward apply public health practice on a war basis!

What a splendid service to the country the members of the Association and their non-member associates can render by attending these meetings, and by disseminating the knowledge and experience shared by them throughout the country!

The people and community require this knowledge and your consideration. Your conscience should demand your attendance.

Mere writing cannot influence you beyond a certain point; true appreciation of the problems ahead should. Closely study the program published with this issue. Note the nature of the discussions and papers to be presented. And then look at the men behind those discussions and papers, men of world and nation-wide authoritativeness; the few men who can instruct the many.

Members, we have a mighty lever in our hands today. Can your country and Association depend upon you to take advantage of its powerful possibilities?

A. D. H.

HEALTH PROTECTION AFTER THE WAR.

In a recent address, President Lowell of Harvard University said that, although we had not prepared for war, we would have no excuse, if, during war, we did not prepare for peace. This applies to public health, as well as to international relations, and the problem is not easy.

The object of war is the achievement of victory, and the health of the soldier is but an incident to that end. When disability on account of wounds or disease cannot be rapidly overcome, the soldier must be discarded, to carry his wounds or his diseases back to his family and his friends.

Reports show that the increase in tuberculosis and venereal diseases in the European armies is appalling. The organizations at work against tuberculosis at the front and venereal diseases behind the trenches will do valuable service, but it would be folly not to admit that, notwithstanding this work, these diseases will increase among our soldiers abroad. So we must consider how we can protect the victims against the late manifestations of their disease, and the folks at home against becoming infected.

First of all, every health organization in the country should be urged to prepare for more difficult work caused by new conditions, and no preparation, we may be sure, will be greater than the demand. The problem is, however, primarily a federal one caused by a national war, and the central government should take the lead.

To protect the world from epidemic diseases that have from time to time been present in our ports the United States Public Health Service originated and has successfully enforced what is now known as "out-going quarantine," and it is believed that this should now be applied to all persons returning to this country from the front. In other words, let the person infected with any contagious disease be quarantined in the country where the infection was contracted until the infectious stage has passed.

The logical way to limit infection is to prevent its leaving a given place, rather than to guard uninfected places. This is the acknowledged method in dealing with acute contagious diseases and may, under the present circumstances, be applied to such chronic diseases as tuberculosis and venereal diseases. It would be necessary for outgoing quarantine stations with complete hospital facilities to be established in one or more French ports, through which all returning to America would be required to pass. Those infected would be detained and treated with the sole object of making them no longer dangerous to others. The effort would be made to convert open tuberculosis into a non-communicable type, failing which, the patients would be sent home under special precautions. Those with syphilis and gonorrhœa would be held and treated until harmless to others. This would be entirely possible, if done at a foreign port. If attempted on this side after the arrival of returning transports, it would be well nigh impossible, on account of the impatience and curiosity of waiting friends. If our

"Sammy" is booked to return and delays occur at the port of embarkation, who knows why and who cares, so long as he comes back well?

Outgoing quarantine is a logical procedure and has been used with complete success to protect the world against our plague and yellow fever. In the hands of the United States Public Health Service or one equally efficient, and with the coöperation of our ally on whose soil our boys are fighting, the method above outlined would do much to protect us against war bred tuberculosis and venereal disease.

S. B. G.

THE HEALTH OFFICERS' RESERVE BILL IN DANGER.

Early in May of this year a resolution was passed by the Conference of State and Provincial Health Officials in favor of creating a National Sanitary Reserve to the United States Public Health Service. As Senate Joint Resolution 63 this promptly passed the Senate. Thence it went to the House and was referred to the Committee on Interstate and Foreign Commerce, in whose hands it lay until August 30, when it finally emerged, somewhat altered, but still useful. At this writing (Sept. 24th), the bill has not yet passed the House. Meanwhile, Congress faces adjournment. Unless influence is brought to bear—and that quickly—it is likely that the Sanitary Reserve Bill will quietly die as the session ends.

The nature of this bill is referred to on pages 560, 673, and 794 of the present volume of the JOURNAL. It has the unanimous support of health authorities in the land: state health officers, the Surgeon-Generals, the Council of National Defense, and others. It is not a political deal, but a war measure of the highest importance. That such a measure of undoubted merit can be held up four months is a reflection upon our legislative methods.

Every sanitarian who loves his country and respects his profession should immediately write—or better—telegraph his Congressman, urging the passage of the Sanitary Reserve Bill. Publish your views in your health bulletins and newspapers, and send marked copies to Congressmen. The most intense activity is necessary as Congress may adjourn in a few days.

A. W. H.

VENEREAL ADVERTISEMENTS.

The bill prohibiting so-called "quack" advertising, introduced on behalf of the New York Social Hygiene Society and passed by the last session of the legislature at Albany, places New York State abreast of our more progressive western states that have enacted similar legislation. This law makes it a misdemeanor for anybody, except boards of health and licensed hospitals and dispensaries, to advertise in any way concerning venereal diseases or other sexual ailments. Penalty for violation of this law is fixed at from fifty to five hundred dollars fine or imprisonment for a term not to exceed six months, or both such fine and imprisonment.

This means that all newspaper, sporting-journal, toilet room and other advertising of this nature must go and that young fellows will no longer be misinformed or so readily mistreated and fleeced by these "specialists." By thus ridding the regular advertising channels of this class of scare-heads and lying promises, the way is cleared for a more aggressive and effective educational advertising campaign on the part of wideawake health departments and dispensaries and, through them, social hygiene organizations.

THE EFFECT OF ATMOSPHERIC CONDITIONS UPON FATIGUE AND EFFICIENCY.

C.-E. A. Winslow,
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THE fitting together of the man and the job is one of the most important problems of modern industry. A correct solution requires on the one hand a study of the task with a view to such modifications as may make it easier of performance; and on the other hand, as Professor Lee has pointed out, a careful consideration of the physiological machine and its capabilities, with constant reference to the time for which the work is to be continued as a factor in securing efficient performance with a minimum of fatigue.

Fatigue and efficiency depend, however, not merely on the man and the task but also on the conditions under which the task is performed, and those which have affected the worker during a preceding period. The potentialities of a given workman on a given day will be influenced by the meals he has eaten on the day before, by the exercise he has taken, by his hours of sleep and by his frame of mind when he comes to work. His actual performance will be largely controlled by the atmospheric conditions and lighting of the workroom, by its physical order and its psychological atmosphere.

I desire in this discussion to call your attention to the great but commonly unrecognized importance of one of these environmental factors in efficiency, the physical condition of the atmosphere of the workroom.

Our knowledge of the relation between air and health has made remarkable and almost revolutionary progress during the past twenty years. In 1896 the Smithsonian Institution published a brochure upon "The Atmosphere in Relation to Human Life and Health," by F. A. R. Russell, Vice-President of the Royal Meteorological Society and Fellow of the Sanitary Institute of Great Britain, which is a good example of the unfounded opinions which so recently ruled in this field of sanitary science. The emphasis is wholly chemical and bacteriological. "The deficiency of oxygen and excess of carbonic acid, which are common to nearly all rooms, schools, churches, theaters, and workshops where many persons are gathered, are very favorable not only to the spread of various infectious diseases, but to the maintenance of a number of minor ailments; and where the exposure to foul air is prolonged, as in workshops, offices, and mills, to a continued depression of vitality," says Mr. Russell. And again, "The spreading, infectious, or epidemic diseases in the animal world and in mankind depend to a very great extent upon aerial influences."

Much water has passed under the bridges since 1896. We know today that

1. The changes in oxygen and carbon dioxid content which take place in the worst ventilated schools, theaters and work places which have ever been studied (excepting bottling works, breweries and other places where carbon dioxid is formed or used in the industrial process itself) are of a magnitude far too small to exert any harmful physiological effects whatever.

2. The organic substances which give a stale odor to the air of crowded rooms may perhaps exert a reflex effect on appetite and hence on the consumption of food, but otherwise they have not been shown to be poisonous or to exert any harmful effect. The liberation by industrial processes or imperfect combustion of poisonous gases and fumes such as carbon monoxid or wood alcohol may, however, be of serious importance in special cases.

3. The air is not a carrier of disease germs except in so far as it may be locally polluted by considerable clouds of infected dust or by the spray discharged from the mouth in coughing, sneezing or loud speaking for a few feet in front of an infected person.

4. Hard metallic or mineral dusts such as are produced in many industrial processes constitute a very real danger to health from their injurious mechanical effects upon the respiratory tract which definitely favor the development of tuberculosis and other respiratory infections.

5. The most far-reaching and important influences of the atmosphere upon health are due not to chemical or bacteriological factors but to the physical condition of the atmosphere itself. The sensations experienced in a badly ventilated room and the serious effects which such a room exerts upon health and efficiency are primarily due to the warmth and stagnation of the air and to its high humidity. The phenomenon, as Professor Lee has so well said, is "physical and cutaneous, not chemical and respiratory"; overheating is the most serious aspect of underventilating.

It seems strange today that sanitarians should have gone so far afield in the search for mysterious organic emanations, "anthropotoxin" and "morbific matter," when the thermal explanation of the effects of bad air lay so close at hand.

The well known influences of climate and season furnish broad and telling evidence of the influence of temperature on human efficiency. Prof. Ellsworth Huntington, in his remarkable book on "Civilization and Climate," has made a detailed study of the development of civilization in different parts of the world in relation to climatic conditions and finds a striking correspondence. His ideal climate is one with an average mean temperature of 15° C. (59° F.), and a range between a mean of −7° C. (19° F.) for the coldest month and 23° C. (73° F.) for the warmest month, and at least twenty storms a year, giving coolness combined with the stimulus of change. The areas where we should expect human energy to reach a maximum according to this criterion are western Europe and eastern North America, with Central Europe, more western North America, Japan, New Zealand and the tip of southern South America next in order. With the exception of the latter region, for which the climatological data are imperfect, these are precisely the points where civilization reaches its highest point, while the warmer countries and the very cold countries form belts of retarded human development.

Professor Huntington's studies of the effect of season upon the productivity of industrial workers provide evidence which is even more significant and more directly in line with the subject which we have immediately in hand. He obtained detailed information as to the weekly earnings of operatives employed on piece work in Connecticut and Pittsburg factories, in North Carolina and Georgia cotton mills, and in carpenter shops and cigar factories in Florida. None of the trades were essentially seasonal in nature, yet the curves show in practically every case two maxima of efficiency in spring and fall with minima in winter and summer. In the north the winter decline is very marked and that in summer less noticeable. In North Carolina and Georgia the two minima are about equal; while in Florida the winter decline is insignificant and that of summer very clearly marked. A mean outdoor temperature of 15.5° to 18° C. (60° to 65° F.) seems in all cases to be most favorable for maximum industrial efficiency.

These figures it should be noted relate to general outdoor conditions, not to those which exist in the factory itself. Still more direct evidence of the immediate relation between air temperature and efficiency is furnished by the experiments which have been carried on by the New York State Commission on Ventilation during the past thee years.

In these investigations over a hundred different subjects, both men and women, were placed for periods approximating a day or a half day of factory work under accurately controlled atmospheric conditions, maintained in specially constructed experimental rooms at the College of the City of New York. They were given physical and mental tasks of various kinds and in some experiments they were served a standard luncheon while in the rooms and their appetite measured by the amount of food eaten. Exhaustive physiological and psychological observations were made of their bodily condition and their efficiency in both mental and physical work was accurately measured.

These experiments showed that stale re-breathed air containing 20 parts or more of carbon dioxid and all the organic and other substances commonly present in such air had no harmful effect on any of the physiological conditions studied, nor on the power or inclination to do mental or physical work, nor even on the comfort of the subjects as indicated by their average vote,—provided the temperature was not allowed to rise as it would generally do in such a room under ordinary conditions. There was, however, a slight but distinct diminution in the appetite for food in the stale air.

On the other hand warm air, whether stale or fresh, produced distinct and clearly marked physiological reactions. At a temperature of 24° C. (75° F.) with 50 per cent. relative humidity the rectal body temperature was .2° C. higher and at a temperature of 30° C. (86° F.), with 80 per cent. relative humidity, it was .5° C. higher than at 20° (68° F.) with 50 per cent. relative humidity. The reclining pulse rate was 5 beats higher and the standing pulse rate 12 beats higher at 24° C. (75° F.) the reclining pulse rate 8 beats higher and the standing pulse rate 17 beats higher at 30° C. (86° F.) than at 20° (68° F.) The systolic blood pressure was not affected at 24° C. but was decreased by 2 mm. reclining and by 7 mm. standing at 30°. The diastolic blood pressure, reclining, was 5 mm. lower at 24° and 10 mm. lower at 30°, while the figure for the standing position was the same at 20° and 24° but was 7 mm. lower at 30°. The Crampton value, an index of the general tone of the vaso-motor system obtained from the relation between the change in blood pressure and heart rate on passing from a reclining to a standing posture was 58 at 20° C., 53 at 24° and 36 at 30°, indicating a progressively less efficient condition of the circulation with increasing temperature.

The power to do either mental or physical work when concentrating for a short period under a strong stimulus was not diminished in these experiments even by the extreme condition of 30° C. (86° F.) with 80 per cent. relative humidity. This coincides with practical experience, for we are all aware that heat, unless very extreme, is no hindrance to absorbing intellectual work and no bar to a good game of tennis.

The effect of heat upon efficiency, unless the influence is a prolonged one, is exercised rather upon the will than on the power to work. Our subjects in some cases were asked each day to vote as to the comfort of the conditions in the experimental room on a scale of five points ranging from 1—very uncomfortable to 5—very comfortable. The average votes for five such experiments are indicated below.

AVERAGE COMFORT VOTES UNDER DIFFERENT ATMOSPHERIC CONDITIONS.

Room temperature		Relative humidity	Comfort vote				
C.	F.		Series I	II	VI	VII	VIII
10°	50°	50%	...	...	...	...	3.4
20	68	50%	3.8	4.2	4.1	4.7	4.1
24	75	30%	...	...	...	...	3.9
24	75	50%	...	...	4.1	4.6	...
24	75	80%	...	...	...	...	3.0
30	86	30%	...	...	...	...	2.8
30	86	80%	2.8	3.6	...	...	2.6

It will be noted that in each series the 20° condition was most appreciated and the warmer and more humid atmospheres became progressively uncomfortable. The difference between 20° and 24° was scarcely appreciable, however, in these records of conscious discomfort. Yet even this range of temperature produced a distinct difference in the demeanor. At 20° our observers' notes are full of such qualifying phrases as "playful, energetic, good work, inclined to 'rough house,' hard to control, less drowsiness than usual"; while at 24° we find such notes as the following; "sleepy, eyes smarted, less inclination to work, lifeless, drowsy, more conversation than usual."

The real effects of air temperature upon efficiency were brought out by a series of "option tests," in which the subjects for a given period were given a choice between physical or mental work on the one hand and idling on the other, receiving a small cash bonus if they did the work. This is a condition which approximates the actual conditions of school and industrial life, in furnishing a real but not an overmastering stimulus to effort, with the alternative possibility of taking life more or less easily.

Even this form of option test did not disclose any harmful effect of the 24° C. (75° F.) condition on purely intellectual work such as mental multiplication. On the contrary the average of three series of experiments with 47 different male and female subjects, extending over a period of 16 weeks, showed that 4.9 per cent. *more* mental multiplication was done at 24° than at 20°. It may be that work of this kind offered a certain distraction under slightly uncomfortable conditions; and it is also

TABLE SHOWING INCLINATION TO DO VARIOUS KINDS OF MENTAL WORK AND TYPEWRITING AT DIFFERENT TEMPERATURES. ALL WORK OPTIONAL.

(Series V, 4 subjects, 6 days. Summer.) Conditions below are in order of occurrence.

	30° 86° F.	24° 75° F.	20° 68° F.	24° 75° F.	30° 86° F.	20° 68° F.
Mental multiplication. Number of problems done times 10. (Score.) Total all subjects	583	1,295	1,495	1,550	1,341	1,930
Percentage of error to mental multiplication score	1.26%	1.19	0.71	0.57	0.65	0.54
Typewriting. Number of lines times 10. Total all subjects	1,085	1,692	2,215	585	290	1,358

possible that the subjects found the 20° condition somewhat too cool for purely sedentary work. It may be noted however that when the temperature was changed abruptly in the middle of the day slightly more mental multiplication was done at 20°. In one series in which a temperature of 30° was also used we obtained the results tabulated below, which are of interest as showing a steady improvement in all tasks during the first three days due to practiçe and to improving temperature conditions. On the fourth day with a temperature of 24° mental multiplication continued to improve with practice, but typewriting fell off, and on the fifth day a rise to 30° caused a falling off in all the tasks, with subsequent improvement on return to 20° on the sixth day.

In all our experiments typewriting, which involves some muscular work, was clearly and unfavorably affected by even a moderate rise in temperature. The table below shows in detail the results as to both mental multiplication and typewriting for three series of experiments. The general average shows as noted above an excess of 4.9 per cent. in mental multiplication at 24° for all series. On the other hand the average amount of typewriting done was 6.3 per cent. greater at the cooler temperature. Both the increase in mental multiplication and the decrease in typewriting at 24° were much more marked when the change in temperature was made in the middle of the day than when the cool and the warm conditions were continued for three to five days at a time.

TABLE SHOWING PRODUCT PRODUCED IN MENTAL MULTIPLICATION AND TYPEWRITING AT DIFFERENT TEMPERATURES WHEN THE WORK IS PERFORMED AT THE OPTION OF THE SUBJECT.

(Figures below are the scores obtained. The score is based on quantity of work done with an allowance for quality of the work.)

Series	Test	68° Half day	75° Change	68° Three day	75° Change
VI. 16 men. 4 weeks. Stagnant air	Mental multiplication	85.8	80.5	51.1	87.4
	Typewriting	324.3	215.7	371.9	450.3
VIII. 16 men. 4 weeks. Stagnant air	Mental multiplication	200.8	212.7	183.2	190.5
	Typewriting	189.4	169.5	330.9	304.0
XIV. 15 women. 8 weeks. Air supply	Mental multiplication	147.7	139.6	52.6	64.5
	Typewriting	289.5	267.3	302.9	306.0
	Addition	154.0	155.5	123.1	123.3

Mental multiplication is a type of pure concentrated intellectual work which has no analogue in the ordinary affairs of daily life. Typewriting on the other hand is fairly typical of most office work which involves a fair proportion of light muscular activity. That the amount of such work performed was 6.3 greater at 20° (68° F.) than at 24° (75° F.) seems a highly significant fact.

Passing to the problem of heavier physical work such as lifting dumb bells or riding a stationary bicycle the effect of temperature was very much more marked. The tests were conducted on the same optional basis used in the previous experiments and the results as tabulated below indicate a striking influence of air conditions, 15 per cent. more work being done at 20° (68° F.) than at 24° (75° F.) and 37 per cent. more than at 30° (86° F).

TABLE SHOWING AMOUNT OF PHYSICAL WORK PERFORMED BY SUBJECTS AT WILL UNDER DIFFERENT TEMPERATURES.

Series	Riding bicycle or lifting dumb-bells
III. Summer. 4 subjects	On 10 days at 30° (86° F.) an average of 31,061 ft. lbs per day was done. On 10 days at 20° (68° F.) an average of 42, 820 ft. lbs. per day was done. This in per cent. is 37% more at 20° (68° F.)
Series	**Lifting dumb-bells. Bonus paid for physical work**
VII. Fall. 4 subjects	On 10 days at 24° (75° F.) an average of 22.075 ft. lbs. per hour was done. On 10 days at 20° (68° F.) an average of 25,250 ft. lbs. per hour was done. This in per cent. is 15 more at 20° (68° F.)

That such conditions of overheating as were used in these experiments are very common in industrial plants is made clear by numerous observations. Thus in the Reports of the Commissioner of Labor of New York State for 1908, 1909 and 1910 there are recorded temperatures observed in 215 different workrooms, printing shops, clothing shops, bakeries, pearl button factories, cigar shops, and laundries. One hundred and fifty-six of these workrooms or 73 per cent. had a temperature of 23° C. (73° F.) or over, and 63 or 29 per cent. had a temperature of 27° C. (80° F.) or over. In tabulating these analyses all cases were excluded in which the outdoor temperature was over 21°(70° F.).

It must always be remembered that indoor temperatures over 20° are much more detrimental in their effects than the same temperatures outdoors, on account of the comparative absence of air movement. The actual effect of the atmosphere upon the body depends on the rate of heat loss from its surface and this depends on the humidity and movement of the air as well as on its temperature. Leonard Hill has devised an instrument called the Katathermometer for measuring the combined effect of all these factors by the rate of cooling of special wet and dry thermometer bulbs previously heated to a temperature above that of the atmosphere. Studies made by me with this instrument have shown that a temperature of 24°–26° C. (75–79° F.) outdoors with a moderate breeze were more comfortable than an indoor temperature of 22° C. (72° F.) in a room with a fire.

The results of our experiments on the effect of air temperature upon optional work cannot of course be directly applied in a quantitative sense to work under factory conditions. Our subjects were permitted to remain entirely idle if they chose. On the other hand they had a slight but distinct money incentive to accomplish as much as possible, while the factory operative, if not employed on piece work, has ample opportunity to work at somewhat less than maximum efficiency without any loss as a result. The experiments cited furnish very clear evidence that a temperature of 24° (75° F.) and still more one of 30° (86° F.) produces a marked disinclination to any form of physical work, even such light work as typewriting. It can hardly be doubted that this disinclination actually results under factory conditions in a definite decrease in output; and if such is the case the problem of securing adequate factory ventilation and taking other steps necessary to prevent overheating is one of vital importance to all who are interested in minimizing fatigue and increasing production in American industry.

MISSING LINKS IN THE CHAIN OF EVIDENCE CONCERNING OCCUPATIONAL DISEASES.

A MAP OF THE ROAD TO HEAVEN BY A SOUL IN PURGATORY.

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UNDER the current system of registering vital statistics, a record is kept of deaths by nativity, sex, and age. Memoranda of this sort are indispensable as a base for calculating life insurance risks and for other purposes. But the occupations which the decedents followed in life are rarely specified; and, if they were, the information from the viewpoint of industrial hygiene would be partly irrelevant and wholly useless, since mortality statistics are like necropsies—they reveal the cause of death (sometimes) but suggest no measures for the prevention of disease.

Occupational hygiene, on the other hand, does not concern itself with the compilation of mortuary tables, but seeks by every possible means to eliminate or control the industrial conditions which tend to cause disease and death of the workers. In order to attain this object there must be an exact and comprehensive preliminary study of industrial conditions in all their ramifications so far as these conditions affect the health of the worker. Some of the data requisite for a mere statement of the problem with which one must cope are not yet available.

First of all, every applicant for employment should undergo a thorough *physical examination* prior to his engagement in any industrial occupation. This measure is necessary for the reciprocal protection of employer and employee. If the medical certificate vouchsafes to the workman a clean bill of health at the time of beginning his labor, any subsequent development of disease should constitute a *prima facie* claim for compensation; whereas, in case the man were found at the outset to be suffering from an organic or constitutional disease, he would be estopped from demanding indemnity for an ailment which he already had on entering his employer's service. Thus the question would be open to all the equities. At present it is difficult to prove or disprove a direct causal relation between the workman's occupation and the illness or invalidism from which he may suffer, and for which he may, or may not, be entitled to receive compensation under the law.

A second requisite is that data concerning occupational diseases should be *sanely collated and interpreted*. As an illustration of the absurd manner in which morbidity statistics are sometimes assembled and misapplied, take a certain monograph on industrial diseases. It contains information of distinct value pertaining to ailments common among workmen occupied in executing various industrial processes. But the work is vitiated and the import of its statistics is obscured by the constant comparison of the data, not with the prevailing morbidity rate from the same diseases in the same locality, yet outside of industrial establishments (a legitimate comparison), but with the number of cases of the same disease in some *other industry elsewhere.* This is elaborate nonsense. Such arbitrary and incompatible correlations are as fatuous and futile as questions in "Hindoo arithmetic:"

"Two-thirds of a large flock of blackbirds alighted in an apple-tree, but a boy brandishing a whip frightened away twenty-five of them. Tell me, pretty Miss with golden locks, how many birds remained in the tree?"

Here is another report which gives 1.46 as the average death-rate from tuberculosis per 1,000 of the population in the principal cities of the United States for the year 1912. But though ostensibly dealing with tuberculosis as an industrial disease and assuming it to be excessively prevalent in some occupations the publication affords no clue to the census of non-fatal cases of the disease in the cities included in the survey among people other than factory and shop workers, and no evidence is adduced to show that the death-rate from tuberculosis was higher among these operatives than in the community as a whole.

Now, since *tuberculosis infection is practically universal,* it is proper to inquire whether tuberculosis in each individual case among the workers in question should be classed as an occupational disease at all; and, if so, to what extent it infests any trade or industry, either in excess of the usual rate prevailing in the community or in a more virulent form than that which generally obtains. With exact data as to the prevalence of tuberculosis in a municipal population as a whole, it would be possible to ascertain whether there is an equal, less, or greater incidence of the scourge among workers in certain trades, thus verifying or correcting the general impression and supplying definite knowledge in place of vague conjecture.

But to exploit a detached and isolated fragment of knowledge (as that tuberculosis affects a given percentage of the workers in an industry) is to give undue prominence to a condition which of itself may have no hygienic significance. The incoördinated fact cannot serve as a safe basis for the inference (much less as a demonstration) that the occupation in question is a factor predisposing to phthisis. The occurrence of the disease may be a mere coincidence or accidental circumstance; or, it may be attributable to extrinsic causes, as infected dwellings, unsanitary environment, lack of physiological resistance or other predisposition due to heredity, unfavorable economic conditions, malnutrition, etc. All other contributory causes must be allowed for before it is possible to isolate and determine the value of the residual etiologic factor, the occupation. For the effect of the occupation is only one of the unknown quantities entering into the equation.

If we should undertake, for instance, to discover what degree of malign influence, if any, the shoe industry may have as an exciting cause of tuberculosis, it would be necessary first to eliminate all other factors, incidental or inherent in external conditions which tend to produce the same result. In a general way, the effect of shoe factory employment in causing consumption, or the absence of such effect upon the workers, could be approximately determined by ascertaining the rate of tuberculosis morbidity per thousand of the population in the selected community and then comparing the percentage of cases in the entire population with the relative proportion of such cases in the local shoe industry. Other conditions being equal, any excess rate of tuberculosis among shoe factory operatives, over and above the general ratio, might then be properly ascribed to the prejudicial influence of the trade. But this excess rate must not be assumed, but proved to exist.

Thus we might set up a *standard or measure of morbidity prevalence* which would yield more valuable information than a comparison of the relative frequency of tuberculosis among shoe factory workers, for example, and clothing trade workers, since labor conditions differ radically in the two industries; whereas, aside from shop, house, and personal hygiene, all people in the same community are subject to essentially identical environing conditions, sanitary or insanitary.

One other consideration is pertinent in this connection, since it should operate as a limitation of the employer's liability. It is a fact that *physical stamina, or the want of it, often determines the choice of a vocation.* The law of natural selection governs the decision. A man with the normal percentage of hæmoglobin in his blood is not likely to become a ladies' tailor or a milliner. It is the anæmic and the weaklings that gravitate into sedentary pursuits, not of their own volition, perhaps, but of necessity. No wonder, then, that tuberculosis finds an abnormally large percentage of victims in the trades into which people of feeble constitution naturally drift. For this, however, the trade processes are not responsible nor employers liable. But workmen's compensation acts should be amended so as to define more accurately the diseases for which indemnities are allowed.

Every industry, therefore, should be investigated and its condition compared, not with that of another *dissimilar and remote* industry, but with what may be termed the *normal local standard of morbidity*, so that a common measure may be applied to all classes and conditions of men. The rate of morbidity from each disease should be determined first for the entire local population, then for workers in the industries separately, and the results compared or contrasted. This would reveal the relative industrial hazards of various trades; and the unit of morbidity incidence in one locality would be conveniently comparable with that of other localities, showing the relative salubrity not only of the occupations, but of different communities, and provoking a wholesome emulation to attain first place in a competition for municipal hygienic improvement.

Finally, as a preliminary undertaking (indispensable for the subsequent working-out of some equitable plan of industrial health insurance), a careful and exhaustive statistical canvass of the entire field of industry should be instituted without delay. A survey of this character will include a census of the local population, with the incidence ratio of all reportable diseases in the community, and, as a distinct exhibit, their relative ratio of incidence among employees in the mills and workshops. These data are essential. When obtainable, they should indicate the aggregate number of cases of disease among industrial workers, and show clearly whether the proportion exceeds or falls below the general rate of prevalence of the same diseases in the community at large, and to what extent for each occupational process.

In default of exact information on these and kindred topics, there is a superfluity of speculation. While no records are available to show the actual ratio of deaths from tuberculosis to the total morbidity from the disease, either in the industries or elsewhere, surmises are plentiful; and, for many readers, vagrant guesses acquire unquestionable respectability when clothed in the conventional dress of a printed report.

To cite a specific instance, Doctor Philip of Edinborough "calculates," that the cases of tuberculosis morbidity are directly proportional to the number of deaths from tuberculosis in any district. He says that the incidence of tuberculosis "may be obtained by multiplying the recorded mortality from tuberculosis by ten," adding, "I believe it might be doubled without exaggeration."*

Apparently the calculations of this noted sanitarian are, in this case, estimates and nothing more. That they are mere sliding-scale conjectures is evident from the author's frank admission that his figures might be safely doubled. This is on a par with the Hibernian answer to the question, How do astronomers ascertain the distance of the stars? "Oh! They guess at half the distance and then multiply by two."

But an estimate, though masked and rendered presentable by a drapery of factitious calculations, is yet an uncouth figure.

Guess-work cannot serve as a basis for statistical tabulation or for computing the incidence of disease. Besides in this instance, there is no excuse for hypothetical assumptions, since an actual census of cases is possible wherever tuberculosis has been made a reportable disease.

In Doctor Crum's admirable paper on "Mortality from Diseases of the Lungs in American Industry," it is shown from tables of the Prudential Insurance Company for the 6-year period, 1907–1912, that "the mortality from tuberculosis of the lungs in the dusty occupations was 41.1 per cent. in excess of the mortality from tuberculosis in the nondusty occupations."*

The natural inference, (though not the intentional implication, of course) is that the percentage of *illness* from tuberculosis in the dusty trades must be correspondingly in excess of that in the nondusty occupations. But morbidity statistics to justify this inference are not forthcoming, and it is possible that the disease may be just as *prevalent,* though *less rapidly fatal,* in occupations where dust is absent and cannot, therefore, be a causative factor.

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*Supplement to Transactions, 6th International Congress on Tuberculosis. Special Volume, p. 251.

**Penn. Med. Journ.*, October, 1916, p. 35.

If data are accessible which tend either to encourage or remove, confirm or dissipate, one's irrepressible doubt as to these points, the proofs should be promptly adduced, so that important questions may be determined by logical deductions that have a scientific basis. If no such data exist, they should be gathered from every available source. The prime requisite is an exhaustive canvass of tuberculosis morbidity; and a simple enumeration of the cases in the registration areas should not be difficult.

But mortality statistics which merely disclose the *death-rates* from tuberculosis are not in any sense a safe gauge of the incidence of the infection, nor, from a prophylactic point of view, do they afford a single suggestion as to the best measures for ridding an industry of the scourge. "Morbidity records," said Dr. John F. Anderson, in his presidential address before the American Public Health Association, "are to the health department its chart and compass."*

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*Address at Cincinnati, October 24, 1916.

THE MILKING MACHINE AS A FACTOR IN THE PRODUCTION OF SANITARY MILK.

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ONE of the important problems confronting the sanitarian today, is the relative importance of the milking machine as a factor in the production of sanitary milk. Machines are being introduced rapidly by farmers because of the increasing difficulty of getting labor, so that the need for accurate information as to the sanitary quality of the milk produced in this way, is great. At present there is a marked difference of opinion. Some sanitarians have claimed that machines are suited for use on certified farms and their use is permitted and encouraged in some places, while others have condemned them and have forbidden their use. Our own studies have shown that there is some justification for both points of view. Some dairies, using milking machines, constantly bring in low-count milk, but a majority of them bring in high-count milk.

Earlier studies at the New York Agricultural Experiment Station have shown that with careful handling, milk of very good sanitary quality may be produced with the machine (1). In a recent examination of the sanitary condition of the machines at the station where B. L. K. milkers have been in use for ten years, thirty-four tests were made by "milking" five liters of sterilized water through one of the machines, just before it was to be used in the regular milking. In some of the experiments (See Table II), by the use of special devices, the water was sampled after passing the teat cups and hose, after passing teat cups, hose and head, and also from the large receptacle of the machine after passing all parts. Sterile water was used in order to eliminate as far as possible such variable factors as the germ content of the milk as it exists in the udder and the contamination from the outside of the cows' teats. It is believed that this is an entirely new method of attacking the problem. The men who were in the habit of cleaning the machines were not notified that the tests were being made, but followed out, as usual, the system of cleaning which had been taught to them. Since they had been doing this for seven years without any special supervision, it is not to be expected that the machines were cleaned equally well every day. Indeed the following results bear out the surmise:

TABLE I.

NUMBER OF COLONIES DEVELOPED ON AGAR PER CC. OF STERILIZED WATER AFTER IT HAD BEEN "MILKED" THROUGH MACHINE CLEANED IN ORDINARY WAY.

Test No.	First milking	Second milking	Third milking	Fourth milking
1	*6,700	....	....	....
2	*3,100	....	....	....
3	1,320	3,890	....	....
4	1,230	1,430	....	....
5	*35,800	*22,200	....	....
6	2,500	2,010	....	....
7	10,800	10,720	....	....
8	4,800	1,900	....	....
9	680	380	....	....
10	3,200	2,400	....	....
11	113	171	....	....
12	460	320	....	....
13	710	870	970	335
14	2,500	4,200	2,720	2,250
15	1,110	950	1,860	2,260
16	2,420	520	1,190	880
17	337	676	438	505
18	582	1,800	928	747
19	3,300	3,000	2,100	2,300
20	2,000	800	1,100	3,000
21	800	585	600	500
22	1,390	4,900	3,400	1,240
Ave. tests 13–22	1,515	1,830	1,330	1,400
Ave. tests 3–22	2,118	2,183		

* Omitted from averages.

Table No. I contains the results of twenty-two tests in which the water was sampled after being received in the receptacle of the machine. In determining the averages of the different sets of milkings, Samples 1 and 2 were left out of consideration because they were not successive milkings into the same compartments of the machine pail, and Sample No. 5 was omitted because of the great difference between the two counts for the first and second milkings. One of the most surprising results was the small amount of difference between the counts when successive milkings were carried out with the same milking machine unit. In the nineteen tests included in the average of the first milkings the bacteria count was 2,118 per cc. and of the second milking, 2,183 per cc. In the ten tests where four successive milkings were done with the same unit, the averages are 1,515, 1,830, 1,330, and 1,400 per cc. To compare these averages with the results of hand milking it would be necessary to add at least 500 to them, since Harding and Wilson (2) have shown this to be the average germ content of the udder. The individual counts on the whole would be considered satisfactory from the standpoint of market milk since they are no greater than from ordinary hand milking, but such an initial contamination might cause trouble at times in a certified dairy.

Table II contains the data which were gathered in an attempt to locate the point at which the contamination took place.

In these tests the counts from the

TABLE II.

NUMBER OF COLONIES DEVELOPED ON AGAR PER CC. OF STERILIZED WATER AFTER IT HAD BEEN "MILKED" THROUGH TEAT-CUPS, TEAT-CUPS AND HEAD OF MACHINE, AND THROUGH ENTIRE MACHINE. ALL WASHED IN ORDINARY WAY.

	First milking			Second milking		
Test No.	Teat cups only	Teat cups and head	Entire machine	Teat cups only	Teat cups and head	Entire machine
1	2	38	2,530	20	15	2,230
2	2	230	10,367	16	1,140	787
3	86	1,270	2,910	191	37	1,670
*4	14	370	8,600	80	18	9,300
5	3	43	184	57	3,855	4,900
6	6	400	8,700	28	1,260	5,100
7	740	8,400	23,600	500	1,020	2,275
8	95	940	840	2,340	11,200	1,260
9	1,680	11,400	8,000	1,510	2,140	3,700
10	549	7,200	6,000	346	1,570	1,820
11	2,080	18,400	25,000	1,810	1,750	1,710
12	12	125	141	185	253	65
13	1,500	1,110	4,800	1,150	520	1,640
Ave.	564	4,144	8,473	686	2,065	3,038

	Third milking			Fourth milking		
	Teat cups only	Teat cups and head	Entire machine	Teat cups only	Teat cups and head	Entire machine
1	5	5	730	13	5	710
2	6	710	1,570	14	—	1,187
3	14	19	37	154	44	30
*4	—	—	—	—	—	—
5	2	3,080	10,300	28	407	10,900
6	2	1,640	13,000	7	—	1,350
7	146	450	4,900	1,710	600	430
8	58	44,400	4,070	129	340	4,100
9	1,730	4,100	5.200	4,370	1,220	1,930
10	105	540	1,010	265	247	11,300
11	680	1,130	760	750	550	610
12	20	24	36	67	—	49
13	203	16,000	1,660	1,520	380	1,380
Ave.	248	6,008	3,606	752	†421	2,831

* Test No. 4 omitted from averages as it was incomplete.

† Only 9 tests in average.

water in the machine were somewhat larger than in those recorded in Table I, the averages being 8,473, 3,038, 3,606 and 2,831 per cc. for the first, second, third and fourth milkings done in succession with the same milking unit. Even though the counts are somewhat larger, the same general conclusions can be drawn as in the previous series. Inspection of the table shows at once that no one part of the machine was responsible at all times for the greater part of the contamination. Sometimes the teat cups and tubes were practically sterile, while at other times they contributed large numbers of bacteria to the water. The same may be said about the head of the machine, except that it usually contributed more than the rubber parts. The pail, although steamed for five minutes, often contributed large numbers to the bacteria count. This may have been due to the fact that the pail of the machine was not dried after steaming. Some of the irregularities in the counts given above suggest that the sampling devices used for the tube and head samples did not always secure representative samples.

In addition to this study of the conditions in our own barn, a visit was also made to each of five farms, in the neighborhood of Geneva, where milking machines were in use. At each of these farms one unit was selected and tested as at the Station by drawing five liters of sterilized water through the machine. When the type of machine permitted, samples were also taken of the water after it had passed through the teat cups and head, but before it was received in the pail of the machine. At the same visit, process samples were taken of the milk at various points on its way from the cow to the final container. In these tests a different machine was used than the one tested with the sterilized water. The process samples consisted of the following:

1. Strippings from the cows milked by the machine.
2. Milk from the machine.
3. The same milk after being poured from the machine into a pail.

TABLE III.

CONDITION OF MACHINES AS FOUND ON FIVE DAIRY FARMS IN THE VICINITY OF GENEVA. NUMBER OF COLONIES DEVELOPED PER CC. OF STERILIZED WATER AFTER IT HAD BEEN PASSED THROUGH THE MACHINES.

First milking			Second milking		
Farm No.	Teat cups, tubes and head	Entire machine	Teat cups, tubes and head	Entire machine	Type of machine
1	2,170	1,050	400	1,190	Hinman
2	195,000	170,000	40,000	36,000	Hinman
3	1,200,000	1,188,000	743,000	629,000	B. L. K.
4	....	1,462,000	....	621,000	Empire
5	3,500,000	3,174,000	2,310,000	2,516,000	Hinman

4. The same milk after it had run over the aerator or through the strainer.

5. The same milk in the milk can. At one farm where the milk was bottled, samples were also taken of the milk as it came from the bottler and again in the bottle. In nearly every case the milk examined was the first milk which came into contact with the utensil tested, after it had been cleaned and prepared for use. The results of this survey are given in Tables III and IV.

TABLE IV.

PROCESS SAMPLES OF MILK TAKEN AT THE SAME FARMS. SAMPLES TAKEN AT THE SAME TIME AS THOSE RECORDED IN TABLE III BUT FROM DIFFERENT MACHINES. FIRST MILKING THROUGH UNIT IN EACH CASE.

Farm No.	Strippings of cow	Entire machine	Milk pail	Aerator and strainer	Milk can
1	1,770	5,800	4,800	....	6,100
2	90	37,000	34,800	59,000	51,000
3	2,170	239,000	243,000	291,000	273,000
4	4,090	1,095,000	1,267,000	1,046,000	1,012,000
5	1,130	*1,003,000			
	780	*900,000	1,016,000	1,180,000	1,350,000

* Two units tested.

The results given in Tables III and IV are typical of what may be expected, at the present time, from the use of the milking machine on the ordinary dairy farm. At the one extreme is milk of very good sanitary quality and at the other, a milk of very poor quality. It so happens in this case that the two extremes represented in the tables were from farms using the same make of machine. In the control work which is done in Geneva by the Station it was found that these two farms bear this same general relationship to each other the year around.

The samples of the water taken after it had passed through the teat cups, tubes and head of machine, indicated that the trouble at these farms was due to failure to sterilize these parts. The farmers at each place used what they believed were solutions of chloride of lime for sterilizing the teat cups and tubes between milkings, but chemical tests showed that these solutions contained barely a trace of free chlorine. The man who produced the lowest-count milk used salt in the solution as well as chloride of lime.

The unsatisfactory nature of the foregoing results led us to attempt a complete sterilization of our own machines by a combination of steam, harmless antiseptics and special cleanliness. After the machine had been washed in the usual manner by the dairyman who had been doing this regularly, the machines were first taken apart, and the separate parts washed, and then sterilized as perfectly as it could be done, using steam under fifteen pounds pressure on all metal parts and a strong chloride of lime solution for all rubber parts.

Just before milking the rubber parts were rinsed thoroughly in boiling water and then the various parts of the machine were assembled, using sterile rubber gloves in handling them.

At the two places where stable air entered the machine, aeroscopes were attached so that the air was filtered through sterile, fine sand before entering the machines. Tests showed that the sand filters were efficient as a means of sterilizing the air. Five liters of water were drawn through the machine as before. The results are given in Table No. V.

Unfortunately, it was found that the water which was "milked" through the machine had not been perfectly protected from contamination by the methods adopted for that purpose. In six tests the difference between the number of colonies obtained before milking and the number obtained after milking was so slight as to indicate that the machine was practically sterile. In the other three tests the difference was small. Further tests are in progress, designed to show whether the machine can be completely sterilized.

The question of the preservation of the teat cups and rubber connections of the milking machine in a sanitary condition, from milking to milking, is one which has always troubled the user. In England, the tendency among sanitarians seems to be to condemn all machines in which rubber parts are used (3). In America the machines which have made the most headway so far, have been those with rubber in their construction. What should be the attitude of sanitarians in this country? In view of the results recorded in this paper, it appears that the machines at present on the market

TABLE V.

MACHINES AT EXPERIMENT STATION CLEANED BY SPECIAL METHODS. NUMBER OF COLONIES ON AGAR PER CC. OF STERILIZED WATER AFTER IT HAD BEEN "MILKED" THROUGH MACHINE.

Test No.	Water before milking	First milking	Second milking	Water before milking	Third milking	Fourth milking
*1	1	5	2	1	4	5
2	5	63	13	10	13	9
*3	1	7	6	—	5	4
*4	4	4	8	5	6	16
5	4	13	16	4	43	14
*6	2	1	2	15	3	6
*7	3	7	—	1	5	16
8	3	25	15	3	15	8
*9	0	2	1	1	10	6
	—	—	—	—	—	—
Averages of all tests	2	14	8	5	12	9
Averages of six tests*	2	4	4	2½	5½	9

in this country when in the hands of an intelligent farmer can be successfully used to produce a milk of higher sanitary quality than that ordinarily obtained from hand milking. Studies are still in progress at the Station designed to determine the best practical method of caring for the milking machine. The final results will appear in the form of a bulletin from the Experiment Station.

REFERENCES.

(1) Harding, H. A., Wilson, J. K., and Smith, G. A. Milking machines: Effect of method of handling on the germ content of the milk. New York Agricultural Experiment Station, Bulletin No. 317, pp. 253-292, plate IV, 1909.

Smith, G. A. and Harding, H. A. Milking Machines: Effect of machine method of milking upon the milk flow. New York Agricultural Experiment Station, Bulletin No. 353, pp. 327-361, plate I, 1912.

(2) Harding, H. A., and Wilson, J. K. A study of the udder flora of cows. New York Agricultural Experiment Station, Tech. Bulletin No. 27, pp. 3-40, 1913.

(3) Report on the trials of milking machines, 1913. Royal Agric. Soc. of England (London), pp. 23, 2 figs., 1914.

Also, Williams, R. S., Golding, J., and Mackintosh, J. Trials of Milking machines. Paper presented at the Australia meeting of the British Assoc. Adv. Science, 1914. Section M., Ref. 210.

REPORT OF COMMITTEE ON SEWERAGE AND SEWAGE DISPOSAL.

OF THE

SANITARY ENGINEERING SECTION, AMERICAN PUBLIC HEALTH ASSOCIATION.

To be presented at the Annual Meeting to be held in Washington, October 17–20, 1917.

THE Committee on Sewerage and Sewage Disposal presented a report at the Annual Meeting of the Sanitary Engineering Section of the American Public Health Association held in Cincinnati on October 26, 1916, suggesting definitions for the terms used in sewerage and sewage disposal practice.

This was intended as a progress report and a full discussion of the definitions was invited. A number of members of the Sanitary Engineering Section forwarded written discussions, and all endorsed the purpose of the committee to clearly define the terms used in sewerage and sewage disposal practice.

The committee has amended a number of the definitions contained in the report presented at the Cincinnati meeting in accordance with the weight which they thought should be given to the criticisms and suggestions received, and has prepared a revised report.

It is hoped that the definitions now presented may be generally acceptable to those engaged or interested in work of sewerage and sewage disposal, and that they will be helpful to the engineering profession.

We recommend that in reports, contracts and agreements prepared by engineers and health officers the terms defined in this report be used and be given the meanings designated herein.

DEFINITIONS OF TERMS USED IN SEWERAGE AND SEWAGE DISPOSAL PRACTICE.

SEWERAGE AND DRAINAGE.

1. SEWAGE

Sewage is a combination of the liquid wastes conducted away from residences, business buildings and institutions, together with those from industrial establishments; and with such ground, surface and storm water as may be present.

(a) *Domestic Sewage* is that from residences, business buildings or institutions.

*(b) *Industrial Wastes* are the liquid wastes resulting from the processes employed in industrial establishments.

2. DRAINAGE

(a) *Surface Water* is that portion of the precipitation which runs off over the surface of the ground.

(b) *Storm Water* is that portion of the precipitation which runs off over the surface during a storm and for such a short period following a storm as the flow exceeds the normal or ordinary run-off.

(c) *Ground Water* is that which is standing in, or passing through, the ground.

3. SEWER

A Sewer is a conduit for carrying off sewage.

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* In the opinion of the committee, the term "Industrial Wastes" is preferable to "Trade Wastes."

(a) *A Common Sewer* is a sewer in which all abuttors have equal rights of entrance and use.

(b) *A House Connection* is a pipe leading from a building to a common sewer.

(c) *A Lateral Sewer* is a sewer which does not receive the sewage from any other common sewer.

*(d) *A Sub-main or Branch Sewer* is a sewer into which the sewage from two or more lateral sewers is discharged.

(e) *A Main or Trunk Sewer* is a sewer into which the sewage from two or more sub-main sewers is discharged.

(f) *An Outfall Sewer* is a sewer extending from the lower end of the collecting system to the point of final discharge into a body of water, or to a sewage treatment plant.

†(g) *A Separate* Sewer* is a sewer intended to receive domestic sewage and industrial wastes without the admixture of surface or storm water.

(h) *A Combined Sewer* is a sewer intended to receive domestic sewage, industrial wastes and surface and storm water.

(i) *An Intercepting Sewer* is a sewer generally laid transversely to the general sewer system to intercept all the sewage collected by the sewers of a separate system or the dry weather flow of sewage and such additional surface and storm water as may be determined from a combined system.

(j) *A Relief Sewer* is a sewer designed to carry a portion of the flow from a district already provided with sewers of insufficient capacity, and thus prevent overtaxing the latter.

(k) *A Storm Water Overflow Sewer* is a sewer designed to carry the excess over a certain volume of combined sewage from a main or intercepting sewer to an independent outlet.

4. DRAIN

A Drain is a conduit for carrying off storm water, surface water, sub-soil or ground water.

(a) *A Storm Drain* is a conduit for carrying off surface and storm water.

(b) *A Land Drain* is a conduit for carrying off sub-soil or ground water, and for draining land.

5. SEWER SYSTEM

A Sewer System is the collecting system of sewers and appurtenances, together with such small pumping stations as may be required to lift the sewage from low-level districts.

(a) *A Combined System* is a system of combined sewers.

(b) *A Separate System* is a system of separate sewers.

6. SEWERAGE WORKS

Sewerage Works comprise the sewer system, main pumping stations, treatment works, means of disposal of effluent and sludge, and all other works necessary to the complete collection, treatment and disposal of the sewage.

7. SEWER APPURTENANCES*

(a) *A Manhole* is a shaft, or chamber, leading from the surface of the ground to the sewer, large enough to enable a man to gain access to the latter.

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*The committee is of the opinion that preference should be given to the term "Sub-main Sewer" rather than to "Branch Sewer."

† In the opinion of the committee, the use of the term "Separate Sewer" is preferable to "Sanitary Sewer," which latter term should be discontinued.

* Drain-structures similar to those defined under sewer, sewer system, sewerage works and sewer appurtenances are to have like names and definitions.

(b) *A Lamphole* is a small vertical pipe or shaft leading from the surface of the ground to the sewer, for admitting a lantern or reflected light for purposes of inspection.

(c) *A Wellhole or Drop Manhole* is a vertical shaft in which sewage is allowed to fall from one sewer to another at a lower level.

(d) *An Inlet* is a connection between the surface of the ground and a combined sewer or drain for the admission of surface or storm water.

(e) *A Catch Basin* is a chamber inserted in an inlet to prevent the admission of grit and other coarse material into the sewer or conduit.

(f) *A Flush Tank* is a tank in which water or sewage is accumulated to be quickly discharged later, for the purpose of flushing the sewer.

(g) *A Regulator* is a device for controlling the quantity of sewage admitted to an intercepting sewer.

(h) *An Outlet* is the end of a sewer or drain from which its contents are finally discharged.

(i) *A Storm Overflow* is a weir, orifice or other device for permitting the discharge from a combined sewer of that portion of the storm flow in excess of that which the sewer is designed to carry.

SEWAGE DISPOSAL.

8. GENERAL TERMS

(a) *Sewage Disposal* is a generic term applied to the act of disposing of sewage by any method.

*(b) *Sewage Treatment* is the process to which sewage is subjected in order to partially remove its impurities or so change them as to render the effluent fit for final discharge.

(c) *Contamination* is the introduction into a water of bacteria or other substances which tend to render it unsuitable for domestic use.

(d) *Pollution* is the introduction into a water of substances of such character and in such quantity that they tend to render the body of water or river objectionable in appearance, or to cause it to give off objectionable odors.

(e) *Influent* is sewage, or partially treated sewage, flowing into any sewage treatment device.

(f) *Effluent* is partially or completely treated sewage flowing out of any sewage treatment device.

(g) *Putrescibility* is the susceptibility of sewage, effluent, or wet sludge, to putrefaction under the conditions to which it is subjected.

(h) *Stability* is the capability of sewage or effluent to resist putrefaction under the conditions to which it is subjected.

(i) *Relative Stability* is the ratio of available oxygen to the oxygen required to prevent putrefaction, expressed in per cent.

(j) *Suspended Solids* are those which are removed from sewage or effluent by standard laboratory methods of filtration.

(k) *Settling Solids* are those suspended matters which will subside in quiescent sewage in two hours.

(l) *Clarification* is a relative term denoting the partial removal of suspended and colloidal matter by strain-ing, sedimentation, or by coagulation and sedimentation.

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* The term "Sewage Purification" should be abandoned.

(m) *Colloidal Matter* (conveniently defined) is the suspended matter which is so finely divided that it will not subside in two hours, yet will not pass through a parchment membrane in the ordinary process of dialysis.

9. SCREENING

Screens. A screen is a device containing openings of proper size to retain a part of the suspended matter of sewage.

(a) *A Coarse Screen* is one having openings in excess of one inch in least dimension.

(b) *A Fine Screen* is one having openings of one-fourth inch, or less, in least dimension.

(c) *A Medium Screen* is one having openings intermediate between a coarse screen and a fine screen.

(d) *A Bar Screen* is one composed of parallel bars or rods.

(e) *A Mesh Screen* is one composed of a fabric, usually of wire.

(f) *A Grating* consists of two sets of parallel bars in the same plane, the sets intersecting at right angles.

(g) *A Band Screen* is one consisting of an endless band or belt of wire mesh or other screening material which passes over upper and lower rollers.

(h) *A Wing Screen* is one having radial or curved vanes, usually composed of uniformly spaced bars, which rotate on a horizontal axis.

(i) *A Drum Screen* is one in the form of a cylinder or cone, consisting of perforated plates or a wire mesh which rotates on an approximately horizontal axis.

(j) *A Disc Screen* consists of a rotating circular perforated disc, with or without a concentric truncated cone of similar material.

(k) *A Cage Screen* consists of a cage, usually with sides of parallel bars or rods, so arranged that it may be lowered into the sewage and raised therefrom for cleaning.

10. TANK TREATMENT

Tank Treatment is the detention of sewage or sewage sludge in tanks, either quiescent or with continuous flow.

(a) *A Grit Chamber* is a chamber or enlarged channel in which the cross-section is so designed that the velocity is such that only heavy solids, such as grit and sand, are deposited, while the lighter organic solids are carried forward in suspension.

(b) *A Sedimentation Tank* is a tank for the partial removal of suspended matter either by quiescent settlement or by continuous flow at such a velocity and time of retention as to allow deposition of suspended matter.

(c) *A Dortmund Tank* is a vertical sedimentation tank, usually cylindrical above and with a conical or hopper-shaped bottom, into which the sewage or partially treated sewage is introduced near the center and after rising through the tank passes out at the surface—the sludge being drawn off, without emptying the tank, before it becomes septic.

(d) *A Hydrolytic Tank* is a sedimentation tank in which by biological processes a portion of the suspended matter is converted into liquid and gaseous form.

(e) *A Septic Tank* is a horizontal, continuous-flow, one-story hydrolytic tank in which the suspended matter is retained until anaërobic decomposition is to a considerable extent effected.

(f) *A Travis Tank* is a two-story hydrolytic tank consisting of an upper, or sedimentation chamber, with steeply sloping bottom, terminating in one or more slots through which the solids may slide as deposited into the lower or sludge digestion chamber, through which a predetermined portion of the sewage is allowed to pass for the purpose of seeding and maintaining bacterial life in the sludge and carrying away decomposition products, thus inducing digestion of the sludge attended by its reduction in volume.

(g) *An Imhoff Tank* is a two-story hydrolytic tank, consisting of an upper, or sedimentation chamber, with steeply sloping bottom, terminating in one or more slots through which the solids may slide as deposited into the lower or sludge digestion chamber—these slots being trapped so as to prevent the rise of gas and solids from the lower chamber—the lower chamber being provided with vents for the escape of the gases, the tank being so constructed as to facilitate the passage of the sewage quickly through the upper chamber and prevent the flow of sewage through the digestion chamber, and intended to be so operated that the sludge may be thoroughly decomposed, rendered practically free from offensive odor and so filled with gas that it can be readily drawn off and dried.

(h) *Activated Sludge Process* is the agitation of a mixture of sewage with about 15 per cent. or more of its volume of biologically active liquid sludge in the presence of ample atmospheric oxygen, for a sufficient period of time at least to coagulate a large proportion of the colloidal substances, followed by sedimentation adequate for the subsidence of the sludge flocculi; the activated sludge having been previously produced by aëration of successive portions of sewage and maintained in its active condition by adequate aëration by itself or in contact with sewage.

(i) *Chemical Precipitation* is the addition to, and thorough mixing with, the sewage of such chemicals as will, by reaction with each other or with the ingredients of the sewage, produce a flocculent precipitant; and subsequent sedimentation.

11. SLUDGE DISPOSAL

Sludge is the suspended solids of the sewage deposited in tanks or intercepted at the surface of filters, mixed with more or less water.

(a) *Sludge Digestion* is the biological process by which organic matter in sludge is gasified, liquefied, mineralized, or converted into stable organic matter.

(b) *Separate Sludge Digestion* is the digestion of sludge in tanks entirely independent from the tanks in which it is produced.

(c) *A Sludge Drying Bed* is a natural or artificial layer of porous material upon which sludge is dried by drainage and evaporation.

(d) *Sludge Concentration* is the process of reducing the volume of sludge, and increasing its proportion of solids by allowing it to stand in a suitable tank until the solids settle down, and drawing off the relatively clean water at the top.

(e) *Sludge Drying* is the process of drying sludge by drainage and evaporation.

(f) *Sludge Dewatering* is the process of removing a portion of the water contained in the sludge by draining, pressing, centrifuging, or by other natural or mechanical processes.

(g) *Sludge Pressing* is the process of dewatering by subjection to pressure, the solids being retained by a cloth fabric which permits the water to pass through it.

(h) *Sludge Cake* is the mass of dewatered sludge resulting from sludge pressing.

(i) *Commercially Dry Sludge* is sludge containing not more than ten per cent. of water.

12. MISCELLANEOUS

(a) *Scum* is a mass of sewage solids, buoyed up in part by entrained gas or grease, and which, consequently, floats at the surface of the sewage.

(b) *Screenings* constitute the material removed from sewage by screens.

(c) *Grit* is the heavy mineral matter deposited from sewage.

(d) *Sleek* is the oily film of microscopic thickness present on the surface of waters about and often extending a considerable distance from sewer outlets.

13. SEWAGE OXIDATION

Sewage Oxidation is the process whereby through the agency of living organisms in the presence of air, the organic matter is converted to a more stable condition or into mineral matter.

(a) *Irrigation* is the process of sewage treatment in which the sewage is applied to land for the primary purpose of purifying the sewage and the secondary purposes of supplying water and fertilizer to crops.

(b) *Surface Irrigation* is the process in which sewage is applied to and distributed over the surface of cropped ground.

(c) *Sub-surface Irrigation* is the process in which sewage is distributed beneath the surface of the ground by means of open-jointed pipes.

(d) *An Intermittent Filter* is a natural or artificial bed of sand or other fine-grained material to which sewage is intermittently applied in doses, and which by its capillarity holds the sewage for a time sufficiently long, in the presence of air, to effect by biological processes a high degree of purification.

(e) *A Contact Bed* is a water-tight basin filled with coarse material, such as broken stone, in contact with which the sewage is for a time held by control of the underdrains—the cycle of operation involving periods of filling, standing full, emptying and resting empty; so regulated as to secure such contact with the bacterial films adhering to the surface of the coarse material, and such aëration of the bacterial surfaces as may be required to oxidize the sewage.

(f) *A Slate Bed* is a water-tight tank filled with slabs of slate or other similar material, laid horizontally and spaced an inch or more apart vertically, equipped so that it may be filled with sewage, allowed to stand full for a definite period of time, drained and allowed to stand empty for a time, for the purpose of oxidizing the organic matter deposited upon and adhering to the slates.

*(g) *A Trickling Filter* is an artificial bed of coarse material, such as crushed stone or clinkers, over which the sewage is distributed as a spray from fixed nozzles or as a film from moving distributors, through which it trickles to the underdrain system, coming in contact with the bacterial films adhering to the surface of the stones, and in which such aëration of the bacterial surfaces as may be required to oxidize the sewage is afforded.

(h) *A Dosing Apparatus* is the apparatus used for regulating the application of sewage to filters or for applying the required quantity of chemicals to sewage.

(i) *A Dosing Tank* is a tank into which raw or partially treated sewage is introduced and held until the desired quantity has been accumulated, and then discharged at such a rate as is necessary for the distribution essential to the subsequent treatment.

(j) *A Sprinkler Nozzle* is a nozzle used for applying sewage in the form of a spray to trickling filters.

(k) *A Distributor* is a movable perforated pipe, channel or water wheel which distributes sewage upon the surface of a trickling filter. There are two types of distributors—the rotary and the traveling; the rotary moves about a central axis with delivery to a circular filter; the traveling moves back and forth the length of a rectangular filter.

14. DISINFECTION

Disinfection is the destruction, by the agency of some chemical, of a large percentage of the bacteria in sewage or contaminated water, so as to materially reduce the danger of infection.

15. STERILIZATION

Sterilization is the destruction, by the agency of some chemical, of all the bacteria in sewage or contaminated water, including their spores.

Respectfully submitted,

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COMMITTEE ON SEWERAGE AND SEWAGE DISPOSAL: Mr. Kenneth Allen, Municipal Bldg., New York City; Mr. Frank A. Barbour, Boston, Mass.; Mr. Harrison P. Eddy, Boston, Mass.; Mr. Langdon Pearse, Chicago, Ill.; Mr. George S. Webster (Chairman), Philadelphia, Pa.

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* The committee is of the opinion that the term "Trickling Filter" is preferable to the term "Sprinkling Filter" or "Percolating Filter," which are frequently used as synonymous terms.

REPORT OF THE COMMITTEE ON STREET CLEANING, SANITARY SECTION, AMERICAN PUBLIC HEALTH ASSOCIATION.

Read before the Sanitary Engineering Section at the Cincinnati Meeting, October 27, 1916.

THE Committee on Street Cleaning, in its report to the Jacksonville meeting (printed in the JOURNAL for March, 1915), called attention to the desirability and importance of a more careful and complete study of the subject of the Sanitary Aspects of Street Dirt and Street Cleaning. It called attention to the widely varying opinions held upon the subject by physicians, sanitary engineers, health officers and the public, and indicated the directions in which further investigations are needed.

The committee has, since, devoted its attention principally to this branch of the subject. It was considered desirable that such data and information as is now available should be collected and placed before the Association as a basis for future work, with the hope that a knowledge of the present status of the subject and the need of further investigation would incite municipal governments, health officials, hospitals, and others to give more careful attention to the subject, and to take the necessary measures to observe and record the facts upon which intelligent conclusions alone could be based.

To this end the committee prepared and sent out to the street cleaning and health departments of every city in the United States and Canada having a population of 100,000 or over, and to a dozen or more of the leading hospitals in the larger cities, a circular letter propounding a set of questions to which replies were earnestly requested. These questions will be referred to in detail in Appendix A.

Similar communications were sent to a number of the older and larger insurance companies and valuable replies were received from the statisticians of two of them.

The committee has been disappointed at the comparatively small number of replies received. A few only of the hospitals addressed replied, invariably to the effect that they could supply no data on the subject. The majority of the replies from street cleaning and health officials were to the effect that while the writers entertained more or less positive opinions upon the subject, no records had been kept and no attempt had been made to organize and maintain a system of records relating to this particular class of vocational employment. It is not unlikely that the failure to reply of so many of those addressed was due to the absence of definite facts to report.

Although the number of replies secured was small, a number of them contained data and observations of great value, and are from men and officials of such high character and attainments as to command attention and great respect, even where, in the absence of recorded facts and statistics, observations and opinions only could be submitted.

It is not too much to say that the material thus brought together and summarized, abstracted or quoted in Appendix A constitutes the most valuable body of fact and opinion now extant upon the Sanitary Aspects of Street Cleaning and Street Dirt.

While the main subject of our investigation was the relation between street cleaning and street waste and the public health, it seemed reasonable to assume that any deleterious effects to the public from street dirt and its handling would manifest themselves in an accentuated degree among those most constantly and intimately exposed; that is, the employees of the street cleaning departments, particularly hand sweepers, operators of sweeping machines, and those collecting and disposing of street waste. The committee, therefore, made special inquiry in regard to these classes of people.

Statistics from the street cleaning department of New York City covering a period of six years show an average death-rate among its employees of 14.8 per thousand, while the records of the health department for the same period show that the average death-rate for all males between the ages of 20 and 70 was 15 per thousand.

The records of the Tuberculosis Clinic of the New York Health Department which deals with all respiratory diseases, show that in 1911, out of 5,936 patients, only seven were street cleaners or connected with street cleaning work.

The statistician of one of the largest life insurance companies remarks that their records seem not to support the common belief that street cleaning work is especially conducive to tubercular troubles, and officials in the street cleaning and health departments of a number of cities observe that the men constantly employed in street cleaning and street waste disposal work are, as a class, as free from the diseases supposed to be incident to such work as other laborers.

Opposed to this conclusion, however, are the statistical records for three years of one of the largest life insurance companies in this country, whose mortality records in over 600 cases of death among street and sewer cleaners indicate an alarming death-rate from tuberculosis of the lungs among the younger age-classes of men in these employments. To what extent, if any, the inclusion of sewer cleaners with street cleaners may affect the result we have no means of knowing, nor do we know the length of time these men were employed in street and sewer work, or, for parts of their lives, in other and possibly more dangerous work. Presumably these men were in sound health when their policies were issued.

Notwithstanding the evidence of these particular insurance records, and the testimony and opinions of others who replied, the consensus of fact and opinion brought out in the replies is decidedly to the effect that street cleaning and the work connected therewith is not, as an occupation, more unhealthful than other laboring occupations, and the inference seems, therefore, to be warranted that since those most directly and constantly exposed to street dirt seem to be as healthy as other classes, the danger to the public at large can not be very great.

There seems to be little reliable data as to the relative unhealthfulness of those living upon or in the vicinity of dumps and filled-in ground made up of street waste. An official investigation and study in 1915 of the physical condition of 119 employees who had been engaged in work upon the dumps at Flushing Meadows, New York, for periods varying from three to six years, disclosed no evidence of infections, such as diphtheria, tuberculosis, septic sore throat, and tonsillar inflammations, although the men lived under the most insanitary conditions and worked on the dumps ten hours per day. The observations and opinions expressed in a number of the replies are almost uniformly to the effect that no deleterious results have been observed among employees engaged upon street waste dumps. In the present state of our knowledge and experience, the conclusion seems justifiable that street cleaning waste dumps are not a serious cause of disease to those living upon or near them. It should not, however, be inferred that this conclusion applies to garbage dumps or to those where garbage is mixed with the ordinary street waste.

It was hardly to be expected that much reliable, definite data is now attainable relating to the occurrence of specific disease-germs in street waste, or to their transmission therefrom to either the employees engaged on the street or to the public at large, but there are notable expressions of opinion to the effect that no such cases have been observed, and that this is not a serious source of danger to the public.

While the consensus of fact and opinion disclosed in the replies is decidedly to the effect that the danger to the public health from street dirt and street cleaning is not a serious cause of disease, the particular source of any such danger as may actually exist was not clearly defined in the questions or referred to in the replies.

The dirt and waste from city streets appears in two distinct physical forms; the fresh, coarse, and usually more or less moist parts or masses that are most easily and quickly collected and removed; and the light, comminuted particles, that, when dry, we call dust.

In the light of our present knowledge and experience there seems to be no substantial reason for believing that the first named class of refuse is a serious menace to the public health, if it is collected and disposed of with reasonable promptness.

Either directly or by inference the replies indicate, as might be expected, that to the street *dust* mainly must be attributed such dangers to the public health as are due to street dirt and street cleaning. Aside from the question to what extent specific disease may be introduced into the human system by inhalation or bodily contact with street dust, it seems to be generally accepted by the medical profession and the public that the introduction of considerable quantities of dust of any kind into the respiratory system must be more or less harmful.

This matter has been the subject of no little investigation and much discussion. There is quite a body of literature on the subject, but the conclusions arrived at by investigators are not in entire accord. This is probably due in part, at least, to the fact that dust occurs in a great variety of composition and forms, differing quite widely in their effects when taken into the body. Thus, Dr. George E. Tucker of Riverside, Cal., concluded after a quite thorough investigation that the workers in Portland Cement Mills, where large quantities of dust are constantly encountered, were apparently benefited rather than injured by breathing the dust, and he cites European experience to the same effect.*

On the other hand it has been conclusively shown that in the Joplin, Mo., mine districts, where the miners are subjected to considerable quantities of rock (flint) dust, tuberculosis prevails to an alarming extent, the death-rate from that disease approximating 200 per thousand of the entire population. It is stated that: "Poor housing, exposure, alcoholism, the use of common drinking receptacles, and overwork all tend to spread infection and lessen the power of the miner to resist disease, but the prime factor in causing pulmonary trouble is the rock dust in the mines.†

In the report of the Ohio State Board of Health on "Industrial Health Hazards and Occupational Diseases in Ohio" (see page 17), Doctor Hayhurst classifies the relative harmfulness of several kinds of dust in the following order: stone dust, mineral dust, ore dust, wood dust, soapstone and talc dust, flour and starch, and natural earth dust, but the basis for this classification is not given. City street dust, which is a combination of many kinds of dust material, probably about 75 per cent. inorganic and 25 per cent. organic, is not mentioned. Doctor Emerson cites, in his reply, statistics from the Tuberculosis Clinics of the New York Health Department showing that out of 5,936 patients, 756 cases occurred where the patients had been exposed to various kinds of dusty occupations, but only seven of these were street cleaners. This would seem to indicate that street dust is not a very dangerous form of this material, but the fact must be taken into consideration that street cleaners work almost wholly in the open air.

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*"Physical Examination of Employees Engaged in the Manufacture of Portland Cement." Paper before the Jacksonville meeting, A. P. H. A. Printed in the JOURNAL for June, 1915.

†"Pulmonary Disease among Miners in the Joplin District, Missouri, and Its Relation to Rock Dust in the Mines." Technical paper 105, Department of the Interior, Bureau of Mines, 1915.

It seems rational, however, to conclude that the introduction of any considerable quantity of foreign, solid matter, whether organic or inorganic, or whatever its composition, into the nose, mouth, laryngitic passages, or lungs, must be more or less injurious to health, notwithstanding the fact that the human system seems to have acquired the ability to absorb or throw off such foreign substances to a remarkable degree; for dust is encountered everywhere. The danger must be materially greater when, as in the case of street dust, it swarms with almost countless numbers of bacteria of many kinds[*] and though the germs of specific diseases may not often have been observed[†] the probability of their presence and the possibility of contagion from them can hardly be doubted.

In view of all the facts disclosed, and notwithstanding the testimony and opinion that street dirt is not, on the whole, a serious menace to the public health, there is abundant reason for believing that street *dust* is a deleterious element in urban life, and that it is the principal source of danger to the public health from dirty streets and street cleaning operations.

If this be so, great attention should be given to preventing its formation, and to its prompt and effectual removal from city streets.

Summarizing the results of our investigation the following conclusions seem warranted.

1st. That street cleaning and work connected therewith, as an occupation, is but little if any more unhealthful than the average of other laboring occupations.

2d. If street cleaners, who are constantly engaged upon the streets, and therefore intensively subjected to the effects of street dirt in all its forms, are not injuriously affected thereby, no great danger to the public health from street dirt and street cleaning operations is to be apprehended.

3d. That such danger therefrom as may exist is almost wholly attributable to street dust.

4th. That dumps and land-fills composed of street waste (unmixed with garbage) are not notably detrimental to the public health.

5th. While disease germs doubtless exist in street dirt and dust, there is, at present, no positive evidence available that germs from this source are responsible for the occurrence of specific diseases, though the possibility and even probability of contagion thereby should be assumed.

It should be noted that we are, in this report, dealing with the sanitary aspects, alone, of street cleaning. There are abundant reasons for keeping city streets clean regardless of the public health.

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[*] See paper by Melville C. Whipple on "The Results of Studies upon the Dust and Bacteria Content of the Air of Cities," read at the Jacksonville meeting, A. P. H. A. Printed in the JOURNAL, August, 1915.

[†] Dr. William Thro of Cornell Medical College has isolated *streptococcus veridens*, supposed to be connected with chronic infectious arthritis, from the dust of New York.

In conclusion the committee again calls attention to the paucity of actual statistics and accurate scientific investigation in this field. The possible importance of the subject as a factor in the public health entitles it to more careful study. The number of employees in the street cleaning departments of our cities is sufficient to warrant their segregation into a separate class of industrial workers, and it is urgently recommended that street cleaning departments, public health departments and the hospitals shall provide and maintain an adequate system of observation and record that shall, in time, enable us to arrive at reliable, definite conclusions as to the true sanitary aspects of street dirt and street cleaning.

S. WHINERY,
GEORGE H. NORTON,
JOHN T. FETHERSTON,
C. M. TALBERT,
RICHARD T. FOX.

APPENDIX A.

ABSTRACTS, SUMMARIES AND QUOTATIONS FROM THE REPLIES RECEIVED TO THE CIRCULAR LETTER.

In considering the replies to the questions sent out it will be most convenient to consider each question seriatim; and, to avoid the repetition in full of the names and official positions of those who favored us with replies, they will be referred to by conventional symbols, as follows:

A. John T. Fetherston, Commissioner of Street Cleaning, New York.

B. Dr. Haven Emerson, Deputy Commissioner, Dept. of Health, New York City.

C. John W. Paxton, Supt. of Street Cleaning, Washington, D. C.

D. Robert E. Doyle, Acting Supt. of Street Cleaning, Washington, D. C.

E. Walter F. Glade, Commissioner of Public Works, Providence, R. I.

F. Dr. Charles V. Chapin, Supt. of Health, Providence, R. I.

G. Gus. H. Hanna, Supt. Dept. of Street Cleaning, Cleveland, Ohio.

H. Dr. C. E. Ford, Commissioner of Health, Cleveland, Ohio.

I. Dr. E. R. Hayhurst, Director, Division of Industrial Hygiene, Ohio State Board of Health.

J. Charles O. Davis, Supt. of Street Sanitation, Milwaukee, Wis.

K. J. G. McBride, Commissioner of Health, Seattle, Washington.

L. Frederick L. Hoffman, Statistician, Prudential Insurance Co., Newark, N. J.

M. Dr. Luis I. Dublin, Statistician, Metropolitan Life Insurance Co., New York.

QUESTION 1.

1. Have you any actual vital statistics or records relating to the unhealthfulness or mortality, as compared with the laboring men of the same general class and age, of men engaged in street cleaning work?

(a) Of those actually engaged on the street as hand or machine sweepers or in collecting sweepings.

(b) Of those engaged in removing street waste from the streets to place of final disposal, especially of those constantly employed upon street-waste dumps.

Replies.

A. Submits a table showing that in 1914, 9,224 medical examinations of employees of and applicants for positions in all positions in the Street Cleaning Department were made, resulting as follows:

Surgical cases,	hernia	79
	Other	1,979
Medical cases,	tuberculosis	94
	Rheumatism	591
	Other	4,598
	Feigning illness	339
	Pension examinations	537
	Examination of new applicants	1,027
		9,244

It will be observed that, excluding the surgical cases, new applicants and feigned illness 1.62 per cent. of the examinations disclosed tuberculosis.

Mr. Fetherston submits also a table giving for each of the years 1909 to 1914 inclusive, the number of regular employees in the department, the number of deaths, and the death-rate per thousand. We have added a fifth column, from data supplied by Doctor Emerson, giving the death-rate of males between the ages of 20 and 69 in the whole city of New York. It is stated that of the deaths in the department in 1914, seven were caused by accidents, thus reducing the number due to disease in that year to 53, or 88 per cent. of the whole number. If we assume a like ratio of accidental deaths for the other years the average disease death-rate per thousand is reduced to 13. The table follows:

Year	No. of regular employees	No. of deaths	Death-rate per 1,000	Death-rate of all males between the ages of 20 and 69 in New York City
1909	5,765	79	13.7	15.20
1910	5,881	80	13.6	15.48
1911	5,148	95	18.4	15.40
1912	5,292	111	21.0	14.80
1913	5,464	62	11.3	14.60
1914	5,474	60	11.0	14.50
Average	5,504	81	14.7	15.00

B. The reply submitted by Doctor Emerson to this and the other questions is of such interest and value that it is attached in full to this report as Appendix B to which special attention is invited.

J. "We have no actual vital statistics concerning this matter. . . . "The Commissioner of Health and others in the health department are inclined to . . . believe there is nothing particularly detrimental in the work of street cleaners, and that, although these men may work in dust and dirt, they are not any more susceptible to tuberculosis or other diseases, than are those employed in other work. They account for this in some measure by the fact that these men are constantly out of doors."

"In the last four years, out of all the men employed in my department, there was only one man who died of consumption, which, I think was contracted before he took city employment."

L. "There is a brief reference to street cleaners in my bulletin 'The Mortality of Consumption in Dusty Trades.' (U. S. Bureau of Labor Statistics, 1908.)

"Since that time we have tabulated our additional experience, and a copy of the same is hereto atttached. You will note that the incidence of tuberculosis is not excessive. The only explanation which we can make is that the risk of tubercular affection through street dust is not as serious as has generally been assumed to be the case. Since most of the street cleaners are physically below the average and are often men who are run down in health through unemployment, etc., it would seem that if street dust was as injurious to health and as dangerous to life as is often assumed, the incidence of tuberculosis would be distinctly higher among those constantly employed on the streets than is actually shown to be the case."

"We have no separate classification of street cleaners and those employed in refuse disposal. As a matter of fact, the number of this group insured with us is relatively small and we would not like to have you attach too much value to our statistics, which, however, are quite suggestive."

The table referred to by Mr. Hoffman giving the Prudential Company's industrial experience, 1897 to 1912, follows:

M. "We find a high proportionate mortality from pulmonary tuberculosis among street and sewer cleaners especially in the age period 25-34, when 55.6 per cent. of all the deaths were from this disease. In all occupations the percentage at this age period from tuberculosis was only 40.9 per cent. In the same way, in the age period 35-44 the percentage of tuberculosis to all causes is 46.9 as against 32.9 in all occupations. I would say that even in our small numbers there is very decided evidence that these workers show an undue amount of pulmonary tuberculosis in their mortality.

You may be interested also in the fact that there is a high incidence of pneumonia. Pneumonia caused 9.5 per cent. of all of the deaths among these people as against 7.2 per cent. in all occupations. It is especially in the later age periods that the conditions become serious. Thus, in the age period 55–64, 10.6 per cent. of all the deaths were from pneumonia although all occupations showed only 7.5 per cent. In the age period 65 and over, 11 per

STREET CLEANERS MORTALITY FROM TUBERCULOSIS OF LUNGS. PRUDENTIAL INSURANCE COMPANY'S INDUSTRIAL EXPERIENCE, 1897–1912.*

Age at death—years	Deaths from		Per cent deaths due to tuberculosis	
	All causes	Tuberculosis	Street cleaners	Males U. S registration area 1900–1905
15–24	1	0	0	27.8
25–34	26	8	30.8	31.3
35–44	65½	21	32.3	23.6
45–54	100	20	20.0	15.0
55–64	104	10	9.6	8.1
65 and over	81	4	4.9	2.7
Totals and averages	377	63	16.7	14.8

*It will be noted that the last column covers only the last six years of the sixteen-year period.

cent. of the deaths were from pneumonia as against 6.3 per cent.

These findings are in accord with the work of others showing the high incidence of the respiratory conditions in those exposed to varying weather conditions, dirt and dust. These workers also show a fairly high incidence of accidents especially in the age period 65 and over. It appears as though they had twice as high a proportion from violence as is experienced by all occupations."

Doctor Lubin, later, supplied a table giving in detail the statistics upon which his conclusions are based. An abstract of this table is here given. (The figures in this table differ slightly, it will be noticed, from the statements above.) It is to be regretted that these statistics cover a period of three years only.

METROPOLITAN LIFE INSURANCE CO.; INDUSTRIAL DEPARTMENT. MORTALITY EXPERIENCE, 1911–1913.

Number of deaths from principal causes and per cent., each cause, of all causes among street and sewer cleaners by age-periods over fifteen years;—white males

(Rearranged from original table)

Total deaths (609)			Percentage of deaths from specified causes, of deaths from all causes in age-periods			
Age periods	No. of deaths each period	Per cent. of whole	Tuberculosis (107 deaths)	Pneumonia (72 deaths)	Bronchitis (6 deaths)	All other causes (424 deaths)
15–24	2	0.3	0.0	—	—	0.3
25–34	22	3.6	59.1	4.5	—	36.2
35–44	72	11.8	44.4	15.3	—	40.3
45–54	122	20.0	27.0	10.7	—	62.2
55–64	196	32.2	10.2	11.7	1.0	77.0
65 and over	195	32.0	4.6	12.3	2.1	81.0
Average age at death		57.4				
Averages			47.7	57.7	67.7	59.7

QUESTION 2.

In the absence of actual statistics will you kindly give the results of any facts or observations of your own covering the matter named in Question 1?

Replies.

D. "The few men who have been with us for a considerable period of time seem to be in good health, and we have no difficulty in regard to sickness with our dumpmen who are constantly employed at places where large amounts of sweepings, ashes, etc., are deposited."

E. "So much has been said in recent times upon the subject of disease-laden dust in city streets, and it has become a matter that we have frequently considered, and has prompted us to carefully observe the conditions of the health of the men employed in cleaning streets, and in particular, those who used the broom and who were more exposed to the dust that they stirred up. As a result of our observations there appeared to be no evidence whatever to sustain the opinion that street dirt is a menace to the public health. A large number of the men engaged in cleaning streets in this city have been employed a long time, some of them for twenty-five (25) years or more. They are a husky, healthy lot. Their general health will compare favorably with any class of men, laboring or otherwise, due, not to the fact that their occupation induces longevity but probably because their work is active and outdoors."

G. "I have watched the condition as to the health of our men from year to year and find that I must differ somewhat with the opinions of the medical profession as to the danger of tubercular germs which might lurk in street sweepings to the detriment of the worker. In order to test out this theory, I have placed men at work as blockers and some as loaders that were afflicted with tuberculosis. They were constantly on the street and handling the débris. All of the men were benefited in health and eventually pronounced cured; not one did we lose. This work, however, is on paved streets that are washed at least twice per week and never get beyond normal as to cleanliness."

I. "In my five years' of experience in the large dispensaries of Chicago and the Cook County Hospital, I discovered a number of instances of street cleaners and garbage men who applied to these institutions for treatment, both surgical and medical, and in which the occupation was a direct, or contributary factor."

QUESTION 3.

In or near many cities there exist extensive deposits or dumps of street waste upon or near which residence districts have been more or less built up.

In such cases have you statistics or records that definitely show the relative healthfulness or unhealthfulness of the people living upon or in the vicinity of such deposits, as compared with other sections of similar character and sanitary conditions except for the presence of these deposits of street waste?

Replies.

B. See Appendix B.

H. "I believe it to be generally recognized that odors from dumps have no effect on nearby residents other than being offensive to esthetic taste."

K. "We dispose of our garbage and waste by the sanitary fill method, and a considerable part of the street sweepings are also deposited in these fills. I have noticed particularly the absence of illness among our employees working in this division.

"Some few months ago I made a survey of the district within a radius of five miles surrounding one of these fills, in regard to health of the people, including infectious diseases in that district, the result of which was that we failed to find any evidence or other reason to believe that infectious diseases are transmitted through the agency of these germs being deposited in this sanitary fill. It is common knowledge, however, in this climate where we have considerable rainfall during the winter months and an absence of freezing weather, that epidemics of la grippe and many sore throat diseases become much more prevalent when we are favored with a few weeks of warm, dry, weather. During this winter period. the streets necessarily become very dry and dusty. This would indicate that many of these diseases become active under such ideal conditions, and cause people to wish for the rainy season, as they invariably do in this city."

QUESTION 4.

In the absence of satisfactory statistics, please give the general results of your investigations, observations and experience covering the matter named in Question 3?

Replies.

A. "From observations in Richmond Borough during a period of nine years, where extensive land fills are made with mixed refuse, indications are that no appreciable degree of unhealthfulness exists where buildings are erected on such dumps, provided the depth of fill did not exceed three feet, which, from practical experience, is the maximum amount of fill within which oxidation of organic matter will take place."

G. "I have not a doubt that where parties dump offal or putrid matter with street sweepings, that during the fermentation of this matter an obnoxious odor, and in damp weather, a mist arises that no doubt is injurious to health but not to the extent that it would cause an epidemic. We have a large number of such dumps here in Cleveland but I cannot recall where anyone living adjacent to them has ever been sick on account of their residence."

QUESTION 5.

In your opinion, based upon your observation and experience, is there any perceptible difference in the relative healthfulness of the people upon or near uncleaned or poorly cleaned streets as compared with those living upon or near well cleaned streets.

Replies.

A. "Undoubtedly cleanliness of streets is reflected in the habits of the people, but in so far as healthfulness is concerned the conditions of houses would appear to have a greater bearing upon health questions than the relative cleanliness of streets."

B. See Appendix B.

F. "Of course, the more untidy streets are inhabited by poorer people and the mortality rate among the poor is higher than among the well to do."

H. "I believe it is recognized that properly cleaned streets are a distinct contribution toward a lowered morbidity and mortality."

I. "I am of the opinion that it would be very difficult to make distinctions as to the healthfulness of the people upon, or near, unclean or poorly cleaned streets, as compared with those living upon or near, well cleaned streets, because of the protean character of other factors which would also have great influence, as for instance the difference in neighborhoods, housing conditions, standards of morals and the like."

J. "In our opinion there is a perceptible difference in the relating healthfulness of persons residing upon or near poorly cleaned streets, as compared with those residing upon or near well cleaned streets. We believe, however, that this is due not only to the condition of the street, but to the fact that the usual sanitary conditions or otherwise in such districts, are unsatisfactory."

K. From observation, "Yes."

QUESTION 6.

As the result of your personal knowledge or experience, or of actual recorded cases, is there evidence or reason to believe that specific diseases are transmitted or spread through the agency of disease germs deposited upon the streets and thence conveyed by flying street dust or otherwise into the human system?

Replies.

A. "A search for information on the subject for years past provides little of value, and as a matter of personal opinion I doubt that disease is spread by flying dust."

B. See Appendix B.

C. "We have no evidence in this city that diseases are spread by the existence of street dust or by an accumulation of refuse, although we assume that such would be the cause if the streets were not regularly cleaned and the refuse carelessly and inefficiently collected and disposed of."

D. "We have no evidence of disease being conveyed by flying street dust but no doubt the breathing of a large amount of street dust would lower the resistance of the body to disease due to irritation caused by the dust particles in the delicate passages of the throat and lungs."

E. "As a result of our observations there appears to be no evidence whatever to sustain the opinion that street dirt is a menace to public health."

F. "I have no knowledge that disease is spread through the agency of germs deposited on the street."

H. "Yes."

I. "I feel very strongly that disease germs deposited upon streets can be conveyed to substances which may get into the human system, or to the skin itself, through the agency of flies and other insects, I believe there is plenty of evidence of experimental sorts to substantiate this, as for instance in the various studies of typhoid fever. On the other hand, I have grave doubts of the specific dangers that may come from disease germs deposited upon street dust, but will state that the street cleaners and repairers are the most likely classes of persons to show any evil effects therefrom. This, I believe, is due to two factors: (1) the quick destruction of disease germs by dessication and light when so deposited, and (2) the limited numbers in which any of them succeed in reaching the portals of entry into the human system. There is a further source of danger, in that wet street drainings may contain virulent organisms, which may, through improper drainage, get into the water supply, and, indirectly, into milk and produce."

J. Difficult to secure evidence. "It is, of course, my belief that cleaned streets are a big factor in public health, and we are convinced that unclean streets result in a greater number of contagious and other diseases."

QUESTION 7.

Inasmuch as other city wastes, such as garbage, night soil, and other refuse, sometimes become mixed to a greater or lesser extent with the street sweepings and may, therefore, affect the general sanitary results, will you please give the committee any statistics, facts or observations collected by you relative to the unhealthfulness of those engaged in dealing with these wastes as compared with those of the same general class engaged in ordinary occupations?

Replies.

A. "The consensus of opinion among officers of this Department engaged in street cleaning and refuse disposal work for a number of years is to the effect that men employed in handling or disposing of wastes are no more subject to disease than others not so employed."

D. "The present contractors for the collection and disposal of city wastes have, without exception, had considerable experience in the collection and disposal of such materials and they state that their collectors and the employees at their plants are singularly free from disease. The dead animal contractor states that he has had a man employed in skinning and cutting up dead horses, which often arrive at the plant in a partially decomposed condition, for the past twenty-five years, and he has never known this man to miss a day or to have anything worse than an occasional cold. The workers at the garbage reduction plant all seem to have a good record for health. The night soil contractor states that his men are practically never sick, although from personal observation I know that they are not overly particular in cleansing themselves of the filth which may accidently get upon their persons. The contractor for the collection and disposal of miscellaneous refuse reports that his employees, who work in an atmosphere full of dust, seem to be almost immune from disease and that he can recall no sicknesses which would likely have been caused by their occupation."

F. "About fifty or sixty men are employed by the garbage contractor in handling garbage. Their term of service is usually too short to determine whether tuberculosis develops among them. As for the acute contagious diseases there has been only one case of diphtheria and none of scarlet fever, smallpox or typhoid fever during the last dozen years, and in twenty-five years I do not remember of a case though it is possible that one or two might have escaped notice in the earlier years.

I. "I have no information upon this point. There is, I believe, a considerable tendency on the part of persons connected with these, as in all industries, to hold up the 10 per cent. or so of persons who have enjoyed unusual health in the midst of undoubted hazards and to draw conclusions therefrom entirely oblivious of the remaining 90 per cent. who have engaged at such work, but concerning the morbidity and mortality of whom they have no information."

"In conclusion I would say that a careful investigation, not of those who are now doing this class of work, but of those who have done so in the past and who are most likely to be found by dispensary, hospital, and institutional searches, as well as inquiries among the unemployed would be most productive of results."

APPENDIX B.

DEPARTMENT OF HEALTH.
CITY OF NEW YORK.
OFFICE OF THE DEPUTY COMMISSIONER

HAVEN EMERSON, M. D.
Deputy Commissioner

August 7th, 1915.

COMMITTEE ON STREET CLEANING
Sanitary Engineering Section
American Public Health Association,
95 Liberty Street, New York

Dear Sirs:

In reply to your letter, questions, 1, 2, 3 and 7 are best answered by the following statement—the result of a study of street cleaners and the employees of the largest ash and refuse disposal company in New York City.

1. (a): An occupational classification of the patients who were treated at the Tuberculosis Clinics of the Health Department in 1911, showed that of 5,936 patients only 7 were street cleaners. This is of interest when compared to the incidence of tuberculosis in others exposed to a variety of dusts, thus:

METALLIC DUSTS.

Mechanics	4
Painters	104
Brass workers	11
Machinists	64
Ironworkers	34
Plumbers	27
Printers	60
Steamfitters	11
Jewellers	20
Tinsmiths	14
Miscellaneous	60
	409

(Painters are here included among sufferers from metallic dusts, because while it is recognized that they are also exposed to turpentine, benzol, and aniline poisoning, lead is the greatest hazard.)

MINERAL DUSTS.

Bricklayers	10
Glaziers	3
Masons	15
Marble polishers	2
Plasterers	12
Stonecutters	7
	49

VEGETABLE DUST.	
Bakers	42
Cigarmakers	54
	96

ORGANIC AND ANIMAL DUST.	
Bootblacks	2
Brushmakers	8
Carpenters	93
Feather workers	22
Furriers	47
Hairgoods workers	13
Harness, hostlers and horseshoers	6
Ragpickers	3
Weavers	8
	202

From this table of comparison it would appear that the work of street cleaners falls within the group of occupations which do not predispose to respiratory diseases, as judged by the frequency with which they resorted to the Departmental clinics whose function is not only to treat the tubercular, but also to diagnose respiratory disorders. The term "street cleaners" as thus far employed, refers to those engaged on the street as hand or machine sweepers or in collecting sweepings."

1. (b): In the month of April, 1915, the Division of Industrial Hygiene conducted an investigation of the sanitary conditions of the dumps at the Flushing Meadows, and also made a study of the physical condition of 119 employees who had been engaged in work on the dumps for a period varying from three to six years in most instances. Quoting a report which was later submitted in connection with this work, "While at first sight is seems practically inevitable that men working for any length of time in an atmosphere of dirt would be ready victims of infectious diseases such as diphtheria, tuberculosis, septic sore throat and tonsillar inflammations of varied etiology," it was really astonishing that no evidence of the occurrence of any of these diseases could be obtained by our examiners. A good deal of this land was under water, and dumping was here being done to reclaim the land. These employees work 10 hours a day, live in the poorest sort of hovels, and as regards toilet facilities general cleanliness and their mode of eating in trenches of refuse with unwashed hands, exist in primitive fashion rare even among the poorest city dwellers. The wearing of protective clothing as distinguished from ordinary street attire, as also the wearing of respirators or goggles were practically unknown. That the particles of dust arising in their work are sharply irritant, if nothing more; is evidenced by the fact that the impaction of foreign particles on the corneas of workers is a constant accompaniment of this work.

It will be noted in the tabulated list of the physical defects that were discovered upon examination, that affections of the nasopharyngeal cavities were most frequently encountered. Heart abnormalities as well as defects of the eyes were relatively speaking, fairly frequent. Forty-four individuals however, or in other words, about 37 per cent. were free from physical defects.

A detailed account of the age groups into which the workers examined fall, together with a tabulated list of the physical findings is herewith attached:

1: AGE GROUPS

From 20 to 30 years	55	employees
30 to 40 "	36	"
40 to 50 "	20	"
and over 50	2	"
No age given	6	"
	119	

2: DEFECTS FOUND.

Pharyngitis		39
Hypertrophied uvula		11
Hypertrophied tonsils		7
Defective septum		1
Fibrinous pleurisy		1
Stomatitis		2
Carious teeth		3
Heart	(1) Hypertrophied	1
	(2) Mitral regurgitation	3
	(3 Myocarditis	1
	(4) Tachycardia	1
Eye	(1) Pterygium	4
	(2) Acute conjunctivitis	6
	(3) Corneal opacity	1
	(4) Foreign body in the eye	2
	(5) Strabismus	1
Malnutrition		1
Scoliosis (with backache)		1
Psoriasis		1
Free from physical defects		44

The absence of causes of bronchitis, pneumonoconiosis, asthma or empyema is, if accepted as an authentic finding, perhaps explained by the fact that these men live and work out of doors most of the time.

Careful inquiry among the men, as well as of those supervising them, elicited nothing but emphatic denials with respect to the existence of respiratory troubles among them.

A list of the names of all those employees who had been examined was sent to the physician in charge of the Health Department Tuberculosis Clinic in the district in which they lived; the records for several years were carefully gone over but not a single one of all these individuals had apparently ever presented himself at this clinic for diagnosis or treatment.

Some months before our investigations had been undertaken, the Sanitary Bureau of the Health Department had caused an investigation to be made with a view to discovering whether persons residing in the neighborhood of the dumps had suffered from diseases traceable to the ashes and heavy clouds of dust created by this work. This inquiry tended to show that the general health conditions of the residents in this locality, compared favorably with those prevailing in parts of the city where the air was not so contaminated.

4. It is not necessary to reply to this question.

5. In giving an opinion upon this, it is evident that what is offered is merely the statement that the people residing in certain streets have dirty and unhygienic habits indoors and out. The neglect of their home conditions is noticeable and where health conditions are found to be bad there is more reason to suspect poor home hygiene than neglect of the street cleaning. We have no data in which the one varient of street dirt plays such a definite role that we could attribute a poor health record to lack of street cleanliness.

6. Recent studies, by Bureau of Laboratories, of the bacteria in street dust, by collecting of scrapings and by plate exposures in strong light and in shade, in traffic and quiet, in breeze and when little air is stirring, do not show presence of pathogenic bacteria constantly or in large numbers. Even the occasional bacterial of pathogenic groups, *i. e.*, pneumococcus and streptococcus varieties, do not seem to be virulent when found under conditions tested. According to my own observation the men working on manure piles continuously, the men working in sewers and as scavangers licensed to remove privy contents and those working on boats carrying offal and dead animals, do not suffer from any diseases referable to their occupations. My firm belief after living continuously in New York City since a child is that the role of street dust is that of mechanical, irritant, and injurious agent, causing perhaps multiple damages to mucous membranes of upper respiratory tract, but that the infection is the result of close personal contact in traffic conveyances and in places of assemblage as stores, theaters, churches, etc, and in homes.

Yours very truly,
(Signed) H. Emerson,
Deputy Commissioner.

PRESENT STATUS OF THE MINERAL WATER INDUSTRY.

FRANK L. RECTOR.

(Abstract.)

THE mineral water industry is a product of the last generation, and was established to meet the need of a safe water when the public supply was polluted or unsightly.

Waters whose source is not above criticism should be denied a market. A water that has to be subjected to some sort of purification before being offered for sale is not a reliable product. Filtration is not continuously efficient, and distillation produces a product that needs further treatment to make it agreeable for use. The more treatment a water undergoes the greater the danger of contamination.

The industry may be divided into five general classes, to which may be added a sixth, although this last group is related in no way to natural waters except in the public mind.

1. Waters for home and office use, selling at a moderate price.
2. Waters, usually carbonated, used in clubs, hotels, etc., selling at a high price.
3. Waters used for medicinal purposes.
4. Waters fortified so as to give them medicinal value.
5. Waters erroneously claiming medicinal value due to the presence of some medicinal agent in small amounts.
6. Waters purified by filtration, distillation, or other methods which changes the chemical or biological content so as to remove them from the class of mineral waters.

Reputable firms engaged in this industry exercise every precaution in handling the product from source to consumer. Only in recent years has the importance of scientific control been appreciated. A visibly clean bottle was thought formerly to be sufficient for the purpose. Today some form of sterilization is necessary to keep pace with sanitary requirements.

Among the questions referred to a scientific staff for decision are: methods of washing and sterilizing bottles and stoppers, examination of solutions used for washing purposes, arrangement of machinery and apparatus in the warehouse, investigation of complaints regarding quality of the water, and many other related problems.

Some dealers bottle their product at or near the source, shipping the bottled product to distributing points; while others ship in bulk, using containers larger than a bottle for this purpose, and bottle at the points of distribution.

In 1915, eight hundred and twelve sources of natural water reported sales of over fifty-two million gallons, having a value of over five million dollars. This water came from every state in the Union except Arizona, Idaho, and District of Columbia.

This industry has a legitimate field for development in coöperation with those forces tending toward sanitary betterment of the community. Its influence is constructive and the worthy elements of the industry merit the coöperation of those interested in seeing the application of sanitary efforts to lines of commercial activity bear fruit.

Laboratory, Great Bear Spring Company,
36 Forty-first St.,
Brooklyn, N. Y.

Book Reviews.

The Modern Milk Problem. *J. Scott MacNutt. New York: The Macmillan Company. Pp. 258. Illustrated. Price, $2.00.*

In the preface the author points out that there are practical and economic as well as sanitary factors in the milk problem of today and that the object of the book is to provide a convenient survey of the perplexing subject.

There has been a tendency on the part of those who are trying to solve the milk problem to concentrate their efforts on one phase of the situation. Some devote their efforts toward the sanitary factors while others lay stress on the economic phase. This book should go a long ways towards straightening out this situation for it gives clearly the relation of the various factors in the milk problem.

The author first explains why there is a milk problem, then points out the situation as it exists today. Following this is an interesting discussion of the sanitary and economic factors involved in the problem. Perhaps the most interesting part of the book is Chapter V, the last chapter which bears the title: "How Solve the Problem." Here the author sums up the salient factors in the solution of the problem in a concise manner in which he shows a clear understanding of the situation.

The section entitled "Who is to Solve the Milk Problem," is commendable but too brief.

Numerous statistics and interesting facts regarding milk are given in the appendices.

The book does not bring out any new facts regarding the milk problem but presents in an excellent manner a survey of the market milk situation. It should be of value to any one interested in the milk problem.

S. Henry Ayres.

Tuberculosis—Its Prevention and Proper Treatment. *Thomas W. Gibson, Albuquerque, N. M. 47 pp. Paper, 35c.*

Mr. Gibson sets forth from the story of his own personal fight with the disease, the means of prevention and the method of cure as his experience has proved their value. The little book is well worth reading by every one, whether sick or well. It is particularly valuable because of the author's cheery note of hope to the sufferer and his assurance that what he has accomplished others may accomplish by following the same painstaking methods.

There are 47 pages in the book. It contains valuable information about various climates and altitudes as well as interesting chapters on Heredity, Prevention, Symptoms, Exercise, Cures and kindred subjects.

One who has tuberculosis or who has a family history of it will do well to read this little book. It may, and likely will, save such a person a great deal of time and money. Single copies of this book sell for 35 cents, and may be had by ordering direct from the author.

The Elements of the Science of Nutrition. *Graham Lusk. Third Edition. Philadelphia: The W. B. Saunders Company, 1917. Pp. 640. Price, $4.50.*

The second edition of this book appeared eight years ago. It represented a remarkable achievement on the part of its author, a most inclusive survey of a wide field and a concise and judicial presentation of results. The progress of studies in dietetics and metabolism has steadily added to the difficulty of such a critical compilation but Doctor Lusk has proved himself equal to the exacting task. The new book is about twice as large as the old, an expansion which could not be avoided if the original standard was to be maintained.

The present interest in problems of nutrition, springing from war-time conditions, has stimulated the production of small books dealing with practical phases of the matter. Some of these are of great value. The new Lusk does not omit a discussion of the economic and hygienic aspects of diet. No writer can treat of these with more wisdom and authority. But the distinction of his work lies in his appraisal of the data of pure science. The book is not primarily for the layman but for the advanced student. There is an extensive treatment of the peculiarities of metabolism in disease and there are few practitioners who would not gain insight by mastering these chapters. Doctor Lusk has an individual style, crisp and clear, which makes his pages pleasant reading in spite of their statistical character and extreme condensation of material. The book stands alone; the facts included cannot be found in any other single work. This volume is indispensable to the specialist in the field it so ably covers.

Percy G. Stiles.

Immune Sera. *Bolduan & Koopman. New York: John Wiley & Sons. Fifth Edition. 1917. 200 pp. Cloth, $1.50.*

There is hardly a more difficult subject in the whole domain of medicine than that dealing with the problems of infection and immunity.

The tendency of most authors of works along this line has been to produce rather cumbersome volumes dealing in minute detail with these phenomena, volumes of great use to the technician, but lacking in attraction to the busy practitioner or to the student who, wishing a knowledge of these matters, has neither time nor inclination to acquire minute details.

Doctor Bolduan's book possesses the marked advantage of a concise and easily comprehended statement of the various problems with which it deals. The mere fact that it has reached its fifth edition proves that a popular demand exists for a simple practical work on this subject.

As a help to the student who desires a fair understanding of the main features of this growing science; as a readable treatise for the busy physician not too large to be slipped into pocket or bag for reference in leisure moments, this little volume is not surpassed.

It also contains a very complete description of the details of the Wassermann test as carried on in the laboratories of the New York Health Department. There is no change in scope from the previous edition but the material has been thoroughly revised.

Francis H. Slack.

Health Department Report.

Spokane, Washington.

Occasionally there comes into the hands of the reviewer for this section of the Journal a municipal health department report which works itself out of that too well worn rut of too many technicalities and too little real interest, a seemingly almost impossible task; an unorthodox report, if judged by past and present experience, which combines the proper data with the elements of interest and attention to report-morphology. Strangely enough these reports are usually Western in origin, which may be the explanation, for to these Western cities are accredited many excellent morbidity and mortality rates and an interested and curious populace.

The Twenty-fifth Annual Report of the Department of Health and Sanitation of the City of Spokane (1916) is of a particularly pleasurable nature, well illustrated, well printed, and a record of excellent work and progress under Dr. John B. Anderson, Health Officer. There occurred during the year 1,051 deaths, resulting in a death-rate of 6.9 per 1,000 if based upon the government population estimate of 150,323; or if based upon the Chamber of Commerce estimate of 130,000, a rate of 8.08 per 1,000. The principle causes of death were organic diseases of the heart, 115, cancer, 112, tuberculosis, 79, pneumonia, 78, and Bright's disease, 76. Contagious and infectious diseases continued at a low point with the following exceptions: there were 3,792 cases of measles reported with 13 deaths; 202 cases of smallpox were reported, though evidently of a mild nature, no deaths resulting. In this connection the smallpox morbidity rate for Washington still continues high on account of the prejudice against vaccination, which is evidently not compulsory. Only 27 cases of typhoid fever were reported with three deaths; 19 of these cases upon investigation are said to have originated out of town. Fifty-nine new cases of pulmonary tuberculosis were reported and 59 deaths were recorded. It is interesting to note that this city, realizing the fear and dread accompanying hospitalization to so many people, has changed the name of the "Isolation Hospital" to the more attractive name of "Rivercrest." The hospital during 1916 attended to 191 patients, the majority of whom were there for smallpox.

As the death-rate is continually decreasing, so is the birth-rate, with at least 98 per cent. birth registration, unfortunately decreasing. In 1912 the birth-rate was 17.45, and in 1916 it had declined to 12.90, 1,940 births having been reported. There occurred 112 deaths of children under one year giving an infant death-rate under one year of age per 1,000 living births of approximately 57.8, an excellent achievement. It is indeed strange, however, that the subject of infant mortality is not considered of sufficient significance to justify a more detailed discussion.

Food inspection, and particularly supervision of the milk supply, has risen after continued effort to a high standard. Such a standard has been obtained through coöperation of the dealer and the producer, plus publicity. The quality of the milk is scored, in accordance with bacteriological and chemical analyses, the score card used being modeled after the government score card, and all scores are published in the newspapers. In dairy inspection attention has been concentrated on methods rather than equipment. Trouble seems to have arisen over the illegal use of the title "Certified Milk," and it is hoped that all such illegal usage shall be penalized. It is felt that the safest milk product can only be attained by the pasteurization of the city milk supply, though precaution will be taken to see that all supplies will maintain the necessary high standard even though it is to be pasteurized, and the date and name of the day of pasteurization shall appear on the label or cap.

Considerable of the discussion of the report is devoted to food inspection, and while this is undoubtedly of vast importance, it would seem possibly more advisable to discuss such subjects as tuberculosis, infant welfare, and disease incidence with greater thoroughness than is done.

Of the recommendations, the two which seem of the greatest importance are the control of the municipal swimming pools by the Health Department and the construction and maintenance of a modern disinfecting and sterilizing plant. It is felt that "to depend upon formaldehyde fumigation in the gaseous form, not under pressure, is pinning our security of freedom from preventable diseases to a very slender line."

Public Health Notes.

Endemic Goiter and Drinking Water.—F. Messerli, of the Hygienic Institute at Lausanne (Switzerland), gave to one set of rats purest Lausanne well-water, while another set received only water from the goiter-region of Payerne, with the following result *Zentrlbl. f. Bakt.*): All the rats receiving the Payerne water became definitely goitrous and showed increased mortality; also, enlarged spleen, diarrhea, and paralysis of the hind legs were frequent (signs of chronic infection). The Payerne drinking-water is a badly contaminated surface-water and has been shown to contain also colon bacilli, paratyphoid bacilli, and the proteus.—*The American Journal of Clinical Medicine*, August, 1917.

◆

Anopheles Identified.—It is the popular idea that the mosquito that sings and causes pain when it stings, transmits malaria. This is a mistake, for the malaria-bearing mosquito is very small, makes no noise and does not cause much pain when it stings and only comes out at night.—*Louisville Health and Hygiene.*

◆

Better Occupational Statistics.—In order that mortality statistics may be more satisfactory as they refer to occupations, Sam L. Rogers, Director of the Census, has sent out circular letters to all the physicians of the country asking that they coöperate to the extent of carefully recording or supervising the statements of occupations upon the death certificates during the year.

The Bureau of the Census is planning in the near future a monograph on tuberculosis. The value of this will be greatly increased if it is possible to show accurately the occupation of decedents.

Director Rogers puts it thus in his appeal to physicians: "As a physician you appreciate the importance of such statistics. As a physician you are by education better qualified than the ordinary informant to understand a proper statement of occupation. Will you not, therefore, take pains to see that the occupation items upon each one of your death certificates are properly supplied?"

◆

Untrained Health Officers.—Here is a place where the trained officer shows his value. An untrained man cannot initiate, cannot lead. He will follow and copy. He is likely to be forced by well-meaning people outside the department to give undue prominence to things not at all of first importance—to "swat-the-fly" campaigns, fights on food adulteration and white-washing dairy barns, instead of attending to such unexciting features as birth registration, sewage disposal and a pure water supply.—Alice Hamilton, *Survey*, January 20, 1917.—*Indiana State Health Bulletin.*

◆

Safeguarding Foods and Drugs.—In the enforcement of the Food and Drugs Act during the last year, U. S. Department of Agriculture officials analyzed 29,833 samples of foods and drugs offered for interstate shipment and for import. A physical examination was made of samples from 76,468 shipments offered for import. Of these foreign shipments, 6,353 were found to violate the law in some respects and were either excluded from the country or admitted only after the importers had relabeled them to comply with the law. Of the samples of domestic products analyzed 3,535, either because of the nature of the product or because the label on it did not tell the truth, were found to be in violation of the federal law. In 1,364 cases the Department recommended to the Department of Justice that criminal prosecution be instituted against the manufacturers or that the goods be seized. In many cases where there was no evidence of intention to defraud, and where there was merely some easily remedied flaw in the wording of a label, the shippers, after being warned in hearings, voluntarily took steps which made their products fully comply with the requirements. In all, there were held 8,715 such hearings, many of which resulted in the prosecutions indicated and the gathering of evidence for a large number of additional cases, which will be forwarded to the Department of Justice. —From *Boston Medical and Surgical Journal* for July 26, 1917.

◆

More Visiting Nurses for New York State.—The *S. C. A. A. News* of New York for July, 1917, contains the following article relative to visiting nurses for county hospitals:

"The new law requiring the estalishment of tuberculosis hospitals in every county in the state of 35,000 population, also makes it obligatory upon the Board of Managers of every county hospital to employ a county nurse for the discovery of tuberculosis cases and for the visitation of such cases and of patients discharged from the hospital.

"The old law gave authority to the Board of Managers to employ a county nurse. Under the provision of the new law the employment of the nurse is made mandatory.

"The value of the work of the county nurse is materially increased by the further provision of the amendment that the Board of Managers of the county hospital shall cause to be examined by the superintendent or one of his medical staff every suspected case of tuberculosis reported to him by the county nurse. All cases reported by physicians, teachers, employers, heads of families, or others, must be examined in the same manner."

PUBLIC HEALTH AND THE WAR.

A Sensible Suggestion From the Austrian Army.—Hecht, an Austrian army surgeon, writing in a recent issue of *Wiener Klinische Wochenschrift*, estimates the number of syphilitics in the Austrian army now must certainly be several hundreds of thousands and complains that they are being treated in hospitals while sound and healthy men are being shot down in their stead. This actually places a premium on sexual infection and spares the syphilitics while the sound are killed. He suggests that a diagnosis of syphilis should be the signal for sending the man to the front. Surgeon Hecht is already denying the soldier afflicted with venereal disease home leave. This restriction had previously been enforced for typhoid carriers. Hecht adds that no one seems to class the venereal diseases with infectious diseases, and is convinced that this neglect to apply measures that have been found reliable with other infectious diseases will avenge itself sooner or later.

Hecht says that since the war began, a total equivalent to sixty divisions have been temporarily withdrawn from the fighting because of venereal diseases, and finally suggests, as a warning to candidates for matrimony, that the daily papers should carry a display advertisement something like this: "Beware of Sexual Diseases. Every couple should mutually demand a certificate of good health before the wedding."

If this frightful condition prevails in the Austrian army it is fair to assume that a similar state exists in the armies of each country. It also indicates what the human race of the future will suffer when all those infected with social diseases return to civil life, bringing with them a condition worse than death on the battlefield.

This picture is black, but it need not materialize. If state and municipal authorities will give the government full coöperation in its most commendable efforts to protect the young men who are to constitute the great fighting force of the country, there will not be a great increase of venereal diseases such as has occurred among the other warring nations. It is the duty of every state and city to assist and protect the army. No greater stimulus can be given to recruiting than to give assurance of clean, healthful and wholesome environment surrounding camp life.—From *Ohio Public Health Journal* for July, 1917.

✣

T. B. Conferences Will Focus on War Problems.—The National Association for the Study and Prevention of Tuberculosis announces that the main theme of all the six sectional conferences will be the problem of the tuberculous soldier or rejected tuberculous recruit. The conferences will be held as follows:

New England Conference, Rutland, Vt., October 4–5.

North Atlantic Conference, Baltimore, Md., October 17–18.

Southern Conference, Chattanooga, Tenn., November 9–10.

Mississippi Valley Conference, St. Paul, Minn., October 8–9–10.

Northwestern Conference, Portland, Ore., October 15–16.

Southwestern Conference, Grand Canyon, Ariz., October 22–23.

✣

Report of Mental Hygiene War Committee.—One of the most far-reaching of the original medical measures that are now being carried out to insure a minimum of unfit men being accepted for the armies of the United States are those devised for the purpose of checking up on the nervous and mental conditions of recruits. The committee states that this is the first attempt ever made in organizing an army to take into consideration the "neuro-psychiatric qualifications of the men." The report has been accepted and officially incorporated into the instructions of the Surgeon General to medical officers charged with examinations of recruits in general and especially to consulting neurologists and alienists assigned to military camps. The following are the instructions of exclusion on neuro-psychiatric grounds:

RECRUITS TO BE EXCLUDED.

I. Nervous Disease.

(a) *On the Basis of Disease*

1. Tabes. (Look for Argyll-Robertson pupils, absent knee and ankle jerks, ataxia of station and gait.)

2. Multiple sclerosis. (Look for absent abdominal reflexes, nystagmus, intention tremor.)

3. Progressive muscular atrophy and syringomyelia. (Look for fibrillary tremors; atrophy in the small muscles of the hand and of the muscles of the shoulder girdle; sears on forearm and fingers caused by burning; deformities of feet.)

4. Epilepsy. (Look for deep scars on tongue, face and head; voice. Where diagnosis depends only upon history of epileptic attacks given by the patient, the latter should be asked to give the address of the physician who has treated him. This history must then be verified by a letter from the physician.)

5. Hyperthyroidism. (Look for persistent tachycardia, exophthalmos, tremor, enlarged thyroid.)

(b) *On the Basis of Symptoms or Combination of Symptoms or History*

1. Unequal pupils+irregular pupils+Argyll-Robertson pupils.

2. Nystagmus (in one not in albino)+absent abdominal reflexes+intention tremor.

3. Absent knee jerks associated with some one other organic neurologic symptom.

4. Exaggerated tendon jerks+Babinski.

5. Disorders of station or gait.

6. Disorders of speech (on test phrases) +facial tremor+one other organic neurologic symptom. (Stammering and stuttering *per es* is not significant of an organic neurologic con-

dition. Stammerers and stutterers are rejected by regulations. See form No. 94777.)

7. History of epilepsy. (Ask the recruit to give the address of the physician who has attended him; this information to be verified by letter.)

II. Mental Diseases.

(a) *On the Basis of Disease*

1. General paralysis. (Look for Argyll-Robertson pupils, speech defect consisting of distortion of words, writing defect consisting of distortion of words, facial tremor in showing the teeth, euphoria and marked discrepancies in giving facts of life.)

2. Dementia præcox. (Look for indifference, ideas of reference, feelings of the mind being tampered with (*e. g.*, ideas of hypnotism), auditory hallucinations, bodily hallucinations such as electrical sensations or sexual sensations, meaningless smiles; in general, inappropriate emotional reactions, lack of connectedness in conversation.)

3. Manic depressive insanity. (Look for mild depressions with or without feeling of inadequacy or mild manic states with exhilaration, talkativeness and over-activity.)

(b) *On the Basis of Symptoms or Combination of Symptoms or History*

1. History of previous mental illness. (Ask the recruit to state when and where he had such illness, in what hospital he was observed or treated or by what physician he was attended; this information to be verified by letter.)

III. Psychoneuroses and Psychopathic Characters.

Look for phobias, morbid doubts and fears, anxiety attacks, fatigue-ability, hypochondriasis, compulsions, homosexuality, grotesque lying, vagabondage.

IV. Chronic Alcoholism.

Look for suffused eyes, prominent superficial blood vessels of the nose and cheek, flabby, bloated, reddened face, purplish discoloration of the mucous membrance of the pharynx and of the soft palate; also ashen complexion and clammy skin; muscular tremor in the protruded tongue and extended fingers; (noticeable also in lack of control when the applicant attempts to sign his name); emotionalism, prevarication, suspicion; auditory or visual hallucinations, paranoid ideas.

V. Mental Deficiency.

Look for defect in general information with reference to native environment, ability to learn, to reason, to calculate, to plan, to construct, to compare, weights, sizes, etc.; defect in judgment, foresight, language, output of effort, suggestibility, stigmata of degeneration, muscular incoördination. (Consult psychometric findings.)

VI. Drug Addiction.

Look for pallor, dryness of skin; flippancy, mild exhilaration (if under the influence); cowardly, cringing attitude, restlessness, anxiety (if without the drug); distortion of the alæ nasi; contracted pupils (morphine) or diluted pupils (cocaine); dirty deposit at junction of gums and teeth; bluish and whitish needle scars on thighs and arms.

✠

National Board of Medical Examiners Certificate accepted by Army and Navy Medical Corps.—The National Board of Medical Examiners held its second examination in Washington, D. C., June 13 to 21. There were twenty-four qualified candidates, twelve of whom appeared for examination, the others having been ordered into active duty between the time of their application and the date of the examination. Of the twelve who took the examination nine passed.

The next examination will be held in Chicago October 10 to 18. The regular Corps of the Army and Navy may be entered by successful candidates, without further professional examination, providing they meet the adaptability and physical requirements.

There will also be an examination in New York City in the early part of December.

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Medical Service in the War.—At the request of some leading medical men in this country, Dr. T. H. Goodwin of England describes the organization of the medical service of the British army on the western front. With each battalion of infantry, regiment of cavalry, or brigade of artillery is a medical officer with a small detachment of medical and sanitary personnel, and suitable medical and surgical equipment. Before an action this officer forms a "regimental aid post" in a dugout or sheltered position to which the wounded of his regiment are brought by the regimental stretcher bearers where their dressings are applied, fractures immobilized, etc., and after a short stay are removed by the field ambulance *bearer* division to advanced or main dressing stations which are formed by the field ambulance *tent* division. The means of transport with the field ambulance bearer division consists of twenty-seven stretcher squads, each of four bearers with a stretcher, seven motor ambulance wagons, and three horse ambulance wagons. From the dressing station the wounded are convoyed by the motor ambulance convoy, consisting of fifty ambulance cars with four medical officers, to the casualty clearing stations, where a large amount of surgery is done. Patients with wounds in the abdomen or head are brought back from the front as quickly as possible for early operation. The casualty clearing station is always near a railway station and the wounded are conveyed thence by ambulance trains to the stationary and general hospitals at the base or on the lines of communication. While definite rules cannot be laid down as to distances the following can be accepted as an average: From the front line trenches to the regimental aid post, 500 yards or more; regimental aid post, to advanced dressing station, half a mile to 1 mile; advanced to main dressing station, 1½ miles; main dressing station to casualty clearing station, 5 miles. The amount of medical supplies required in modern warfare is very large and in addition to these there are almost innumerable articles outside of the authorized equipment which are of immense value for the comfort and diversion of the patient. He speaks of the value of the Red Cross Service in giving aid to the regular army medical corps and speaks of the cordial coöperation of the tactful army surgeon with the fighting officers. The subject of sanitation is always a live one and the opportunities for professional work and experience are very great. In conclusion he speaks of the shortage of medical men and the consequent increasing demand. In several districts in England there is only one physician left to every 5,000 inhabitants. On the western front alone since the beginning of the war there have been 195 medical officers killed in action, 707 wounded and 62 deaths from disease. He also speaks appreciatively of the aid furnished by the United States. Six base units from the United States are now hard at work in France and a total of 253 medical men and 434 nurses have already gone over.—*Jour. A. M. A., July 21.*

Facts for Fighters.—The following "Supply," bulletin has been issued and circulated among Massachusetts guardsmen and drafted men by the Massachusetts Anti-Tuberculosis League:

Consumption can be contracted by those who are weak, run down, or in any way in poor condition.

In private life any person may take chances with his health, if he cares to do such a foolish thing, without necessarily hurting others or the community at large. In time of war this is different. The soldier owes it to his country to maintain his bodily efficiency at the very highest possible point. This is the best way to avoid consumption.

When a soldier is on duty, the details of his life are regulated in every way. When he is off duty he can do himself physical harm or good. Therefore he should spend this time as profitably as possible by increasing his bodily strength and energy and not wasting it. This is an important way of preventing consumption.

Excesses of all kinds weaken a man and render him liable to infection, especially to infection with consumption.

Remember that the germs of consumption and other contagious diseases are spread by spit. Therefore never spit in closely crowded quarters, barracks, tents, etc.

Danger signals. If you develop a cough, with or without spit, which hangs on for some time; if you raise any blood; if you are losing weight and strength, don't wait but go at once to the proper person and place these facts before him.

If you know that you have consumption, even though you have passed the physical examination, don't conceal it. The chances are that you will break down later on. You will do your country no good, but on the contrary you will do it great harm if you conceal this fact.

Remember that one of the greatest things you, as a soldier, can offer to your country is good health.—*Massachusetts Anti-Tuberculosis League.*

An illustrated pamphlet designed for similar circulation has been issued as "Keep Well Leaflet No. 10" by the Educational Bureau of the New York City Health Department, emphasizing the dangers of venereal infection.

Health Officers' Loan Library.—Among other services to local health officers the North Dakota State Board of Health lists a Health Officers' Loan Library and a stereopticon Loan Library.

Public Health Clippings.

An Old Fable—

Once upon a time there was a city with a street running along a cliff. In dark and stormy weather so many people were injured by falling over the edge that the citizens gathered together to see what they could do about it. They decided to use their resources to build a hospital at the foot of the cliff so that the injured might receive immediate attention.

Now, it chanced that a great physician visited their land, and the inhabitants showed him the hospital with great pride. But he, looking up at the cliff, said: "Wouldn't it have been cheaper in lives and money to build a wall of protection along the cliff?"

—Brought up to Date.

Once upon a time a great country went to war and needed her strong men to fight her battles. But when her sons were called together only half of them were found fit to do battle, the others being deficient in health and lacking in physical strength. "What shall we do?" said the people. "Unless our men are strong in body they will lose in battle. Let us ask Congress to appropriate a great sum and build hospitals where they may receive treatment and be cured of their diseases." And this Congress approved.

But some said: "A pity it is that great sums of money should be spent for this purpose now, whereas small sums spent a few years ago when these were boys would have made this unnecessary and saved the country's manhood from this blight of ill health and inefficiency."

And the people said, "Yea, truly! A poorer nation, but a wiser one, will we be when the war is over."—*North Carolina Health Bulletin.*

✣

Three Maidens.

A maiden person stern and tense
Gave modest people great offense
Because she'd rant and tear her soul
An advocate of birth control.

A maiden lady growing stout
Of dietetics long would shout
She gladly met starvation's toll.
An advocate of girth control.

A maiden woman glum and dour
With face that's long and thin and sour
Frowns on our joys in part and whole
And advocate of mirth control.

—*Illinois Health News.*

✣

We Should Economize.

But It Is Not Economy

To buy a cheap grade of milk for the baby;

To substitute condensed milk for cows' milk;

To neglect to keep milk on ice;

To allow windows and doors to go unscreened;

To keep windows closed to save coal;

To delay calling a doctor when unexplained illness occurs;

To curtail the health officer because of extraordinary expenses.—*Wisconsin State Board of Health Bulletin.*

✣

The Efficient Life.

Don't get the idea that good health is merely absence of disease or sickness. It is far more. One may not feel sick at all and still be only 60, 70, or 75 per cent. efficient. Good health is 100 per cent. of physical efficiency. It is that physical state of being where life is a joy, and plenty of hard work is a pleasure.

✣

The Quack.

The quack doctor is among the most despicable of swindlers. He extorts the last dollar from the sick. He holds out false hopes. He inspires needless fears. He finds dangerous maladies where none exist. He deals in falsehood, relies on ignorance, capitalizes misfortune, teaches despair for his own profit and resorts to blackmail as a useful collection agency. He prostitutes the noble art of healing to lure in trusting victims.—*Cleveland News.*

—*Boston Health Bulletin.*

Or Nerve?

Lest we forget the Druggist's prayer, "Oh, Lord! give us courage this day to ask higher prices."—*The Pacific Pharmacist*, August, 1917.

*

Behind or Befront.

The front yard is a pretty good index to the people who live in the house, but the back yard is a better index to their lives, their health and their habits of cleanliness.—*Louisiana State Board of Health.*

*

A Stitch in Time.

Removing the cause before it becomes a result is the best kind of public health work!—*Los Angeles Monthly Bulletin.*

*

One's Sufficient—And Sufficient's Plenty.

Dr. Plummer of Key West delicately told his colored patient that he had tuberculosis, but not to be alarmed—it was a curable disease. "Na, na, Doctor," said the old darkey, despondently, "My wife died of 'buckalosis' and she didn't have bot one. Na, na, Doctor."

The Strides of Science.

From a child's essay on tuberculosis—"Tuberculosis used to kill everybody, but now anybody can cure it—even the doctors sometimes do."

First-Hand Knowledge.

Headline in a local paper: "Splendid Lecture on Hookworms—The Doctor Full of His Subject."—*Florida Health Bulletin.*

*

Crime is largely sickness and disease.

Sickness lies at the bottom of delinquency.

"More virtue" is the cry, and virtue is health.

Hygiene can prevent more crime than any law.—*Munsterberg.*

National health will be followed by national efficiency.—*Fisher.*

Would you lower taxes? Then you must lessen disease.—*Reed.*

Neglect the public health, and taxes will surely increase.—*Reed.*

Healthy, strong men seek education and make opportunity.—*Jordan.*

Neglect the nation's health if you wish to make it decadent.—*Billings.*

Conservation of resources will naturally follow conservation of health.—*Fisher.*

It is within the power of man to drive sickness and disease from the world.—*Pasteur.*

The government which does not protect the health of its citizens is neither intelligent nor moral.—*Spencer.*

The State must prevent sickness and disease, if crime, poverty, delinquency and insanity, with their awful cost, are to be reduced.—*Monthly Bulletin* (Indiana).

*

Do We Eat to Dye?

Cheap candies satisfy childhood's appetites for sweets, but they may prove costly in the end. This cheap candy is colored with powerful dye-materials. Prof. D. R. Hodgdon, of the State Normal School at Newark, N. J., has dressed a doll which he calls the "fraudulent Miss," to show the effect of coal-tar dyes which may be obtained from candies. Professor Hodgdon says:

"The doll is eighteen inches high. Its dress and stockings are dyed from coal-tar dye obtained from lollypops. Its shoes are blackened with lampblack obtained from licorice candy. The lampblack was extracted and used in its proper place, as shoe blacking. The shoes are made to shine with shellac which was used on peach-piths, a penny candy which may be purchased from the usual penny candy shop next to a school building. The hair was glued on with carpenter's glue obtained from 'All-Day-Suckers.' She holds in her hand a steel kitchen knife which has been copper-plated with copper obtained from a can of French peas, and beside her hangs a baby's stocking colored pink with the dye obtained from peach-pith candy."—*Bulletin* Penna. Dept. of Ag.

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Healthgrams.

A flyscreen over the food looks better than a crêpe on the door.

The registration of illness is as important as the registration of deaths.

Wild oats do not make a palatable breakfast food.

Industrial Hygiene and Sanitation.

Infection after Accidents.—Of the 73,525 industrial accidents for which awards were made by the Industrial Commission of Ohio for the twelve months ending June 30, 1915, infection was reported in connection with 7,073 of this number, or, in other words, approximately one out of every ten industrial injuries become infected. It is safe to say that a reasonable effort to give injuries aseptic dressing would have saved much suffering, would have prevented a considerable number of permanent partial disabilities, and would have saved human lives.—*Bulletin of the Industrial Commission of Ohio*, Vol. 4, No. 3.

✱

Some Vital Facts and Considerations in Respect to Compulsory Health Insurance.—This report represents the arguments of Magnus W. Alexander of West Lynn, Mass., as presented at legislative hearings in New York State and in Massachusetts on March 7 and March 13, 1917, respectively.

✱

Labor Legislation Enacted in New York State in 1917.—The July Bulletin of the New York Department of Labor bears the title "Dangers in Manufacture of Paris Green and Scheele's Green." These products are manufactured by ten firms in the United States, of which seven firms are located in the State of New York. The danger lies in the fact that workmen handling the product, finished or unfinished, may contract arsenic poisoning. The bulletin gives the working conditions in the factories as found on investigation. The State Department of Labor furnishes printed notices with recommendations to employees in these establishments and to employers, as well.

✱

British Explosives Factories in 1916.—According to the *Report of the Home Office Inspectors of Explosives* for 1916, the number of new explosives factories licensed during the year was 23, making a total of 48 since the outbreak of the war. The general condition of the factories is very satisfactory, but the inspectors have considerable difficulty in impressing on the picric acid manufacturers the necessity for the strict observance of the requirements in regard to cleanliness and freedom from grit in danger buildings. The total number of accidents reported with explosives during the year was 641, as compared with 485 in 1915. The number of deaths was 195.—*The Canadian Chemical Journal*, September, 1917.

✱

Industrial Efficiency and Fatigue in British Munition Factories.—*Bulletin Number 230 of the U. S. Bureau of Labor Statistics* contains reprints of the interim report and memoranda of the British Health of Munition Workers Committee. The committee took evidence in various industrial centers from employers, representatives of workers, and other interested persons, and made numerous special studies and investigations. The committee has published up to the present time seventeen memoranda. The data collected are in all cases prejudicial to night work, which is therefore, although necessary in the present crisis, to be considered undesirable. The committee found, however, that the rate of output on the night shift is substantially the same as on the day shift, where both shifts are managed on the discontinuous system. Both men and women can more profitably be organized under the discontinuous than under the continuous system of night work. Time gained by extraordinary hours is often lost in normal hours under favorable factory conditions. The committee was impressed by the fact that earnings influence the health and efficiency of workers, and that output may be influenced by the wage system in force. Payment by the piece seems to bring a direct stimulus to bear upon the natural inclination to work. Piece rates may be expected to give a greater output than time wages. The medical examination brought out evidence of strain and fatigue, but the majority of the workers appeared to be in good health at the time of the examinations. The risk of future breakdown, however, is not negligible. The examination of women and girls emphasized the importance of adequate provision for the health and comfort of workers. Quite as important as welfare supervision and comfort of workers while on duty is the consideration of their health outside the factory.

Rules and Regulations for the Prevention of Anthrax.—Massachusetts has had a considerable number of anthrax cases in the past and the *Industrial Bulletin No. 6 of the Massachusetts State Board of Labor and Industries* is for this reason a very timely document. It has been prepared by Thomas F. Harrington, Deputy Commissioner of Labor, and deals with the sources of infection as well as with the prophylactic measures. Methods are given for the disinfection of hides, skins, hair, and bristles. The disinfection by the manufacturer may be dispensed with if he presents proof in writing stating that the material has been disinfected in accordance with the requirements of the United States Treasury Department or of the Massachusetts State Department of Health. The bulletin concludes with a set of rules pertaining to the sanitation of workshops and personal precautions.

✠

Carbon Monoxide Poisoning in the Steel Industry.—In the *Technical Paper 156 of the U. S. Bureau of Mines*, I. A. Watkins sets forth briefly the liability to carbon monoxide poisoning of those employed in the various departments of a steel plant; the sources of the gas; the extent to which it is present; its effect on workers; and certain recommendations for the prevention and remedy of such conditions. The U. S. Public Health Service coöperated in this investigation. Attention was given primarily to the liability to chronic poisoning—that is, the daily exposure of employees to small quantities of the gas over an extended period of time—rather than to that of acute poisoning. Carbon monoxide is the most important of the poisonous gases encountered in the industries. Individual resistance enters largely into the results of this form of poisoning. A most serious effect of carbon monoxide is that which it has on the heart. Palpitation and distress about that organ are common complaints. After continued exposure anemia generally ensues. The efficiency of the worker is markedly decreased. In a steel plant carbon monoxide may be found about blast furnaces, gas washers, and scrubbers, gas engines, gas producers, gas boilers, cupola furnaces, dolomite furnaces, "donkey engines" or small locomotives, and "shanties" or rest rooms for employees. Watkins recommends that a survey should be made in steel plants with the view of determining whether carbon monoxide is escaping into the atmosphere breathed by workmen and some system of regular periodical inspection should be instituted. A method is given for sampling the air and determining its carbon monoxide content.

Personal Notes.

Members and subscribers enlisting in the Sanitary Service, or other war divisions, are respectfully requested to inform the Editor, for notice in these columns.

*

Vernon Robbins, M. D., C. P. H. (Harvard–Technology), formerly of Louisville, Ky., has been appointed county and city health officer at Helena, Ark.

*

Mr. C. A. Abele has been appointed a chief sanitary inspector for the Red Cross service, and is stationed at Anniston, Ala.

*

Dr. F. M. Meader, of the New York State Health Department, has entered the army medical service with the rank of captain.

*

The following have been elected to membership in the American Public Health Association:

Mr. David W. Roberts, Fredericton, N. B.
J. Bernard Nelson, Ph. B., M. D., Mesa, Ariz.
Mr. C. R. Nickolls, St. Louis, Mo.
Louis Z. Normandin, M. D., New Bedford, Mass.
G. B. Schwachtgen, M. D., Aurora, Ill.
M. R. Wetmore, M. D., New York City.
Mr. Ole Salthe, Brooklyn, N. Y.
Mr. B. M. Lide, Jr., St. Louis, Mo.
Mr. Harold Macy, Geneva, N. Y.
J. A. Nydegger, A. M., M. D., Sc. D., Baltimore, Md.
Florence Brown Sherbon, A. M., M. D., Topeka, Kan.
Miss Leona Maloney, Fall River, Mass.
Mr. Paris Ripley Eastman, Albany, N. Y.

*

Mr. R. R. Harkness has been appointed health officer at York, Maine. He succeeds Mr. Aaron Pratt, who has been appointed a district health officer of Maine.

Current Public Health Literature.

AMERICAN.

American City.

XVII. September.

Coöperation the Keynote in Dallas Public Health Activities.
Reconstruction and Rehabilitation Work in Europe.
Chloramine for Water Sterilization.
The Use of Ultra Violet Rays in Sterilizing Water.

American Journal of Nursing.

XVII. September.

Teaching Nurses in Training the Uses and Value of Sickness Statistics. Louis I. Dublin.
Teaching in the Hospital and the Public Health Service. Elizabeth Burgess, R. N.
The Relation of the Private Duty Nurse to the Public, as a Social Worker. Marie T. Lockwood.

Boston Medical and Surgical Journal.

CLXXVII. August 16.

Industrial Benzol Poisoning in Massachusetts. Thomas F. Harrington, M. D.
An Epidemic of Dysentery at the Boston State Hospital, Due to a Member of the Paratyphoid-Enteriditis Group (continued). Mary Elizabeth Morse, M. D., and Geneva Tryon, M. D.

CLXXVII. August 23.

The Medical Profession and Social Progress. Andrew F. Downing, M. D.
Studies of Infant Feeding: VIII. The Mineral Constituents (Ash) of Milk. A. W. Bosworth and H. I. Bowditch, M. D.
An Epidemic of Dysentery at the Boston State Hospital (concluded).

CLXXVII. August 30.

Uniformity in Hospital Morbidity Reports. E. A. Codman, M. D.

CLXXVII. September 6.

The Newer Methods of Diagnostic Technic. Frederick T. Lord, M. D.
Bruck's Sero-Chemical Test for Syphilis: A Report of Four Hundred Cases Compared with the Wassermann Reaction. Curtis E. Smith and H. C. Solomon, M. D.

Journal of the American Medical Association.

LXIX. September 1.

A Report of a Group of One Hundred and Ten Cases of Poliomyelitis from the Acute Onset to the Present Time. Charles Ogilvy, M. D.
Mode of Infection, Means of Prevention, and Specific Treatment, of Epidemic Meningitis (concluded in September 8 issue). Simon Flexner, M. D.

LXIX. September 8.

A Simple Method of Agglutination of Meningococci. Ruth Turnacliff, M. D.
Report of an Outbreak of Diphtheric Wound Infection Among Returned Soldiers. J. G. Fitzgerald, M. B., and D. E. Robertson, M. B.

LXIX. September 15.

Serum Therapy for Trichinosis. Benjamin Schwartz, B. A.
The Necessity of a Pure Raw Milk. Henry Dwight Chapin, M. D.

Journal of Bacteriology.

II. July.

The Importance of Uniform Culture Media in the Bacteriological Examination of Disinfectants. J. H. Wright.
Studies on the Nomenclature and Classification of the Bacteria: III. The Families of the Eubacteriales. R. E. Buchanan.
The Effect of Hydrogen Ion Concentration on the Production of Precipitates in a Solution of Peptone and Its Relation to the Nutritive Value of Media. I. J. Kligler.
Observations on the Types of Organisms Isolated from Water after Treatment with Calcium Hypochlorite. M. A. Smeeton.
The Morphology of a Strain of B. Diphtheriæ. P. G. Heinemann.
A Note on the Preparation of Hyphomycetes for Microscopical Examination. Mark F. Boyd.
Blastocystis Hominis: Its Characteristics and its Prevalence in Intestinal Content and Feces in South Carolina. Kenneth M. Lynch.
Characteristics of Coli-like Microörganisms from the Soil. B. R. Johnson and Max Levine.
The Effect of Sterilization upon Sugars in Culture Media. Courtland S. Mudge.
A Study of the Diphtheroid Group of Organisms with Special Reference to its Relation to the Streptococci. Ralph R. Mellon.

Journal of the Outdoor Life.

XIV. September.

Glimpses of the Infant Consultation Clinics at Framingham, Mass.
The Framingham Health and Tuberculosis Demonstration. Donald B. Armstrong, M. D.
A Health Center in a Large City. Robert H. Bishop, Jr., M. D.
The Physiology of Worry. Irene Morton, R. N.

Journal of Laboratory and Clinical Medicine.

II. July.

Cheese Poisoning. A Toxicogenic Bacillus Isolated from Cheese. William Levin, M. S. P. H.

The Nurse.

VI. September.

Serum and Vaccine Therapy: I. Immunity and Vaccination. Robert Kilduff, M. D.
Hay Fever—Its Causes and Prevention. Six Engravings from Photographs.
The Nurse in Public Service. Creighton Baker, M. D.
How to Conserve the Food Supply.
Some Statistics on Diphtheria.

New York Medical Journal.

CVI. September 1.

Studies in Acute Anterior Poliomyelitis. George D. Heist, M. D., Myer Solis-Cohen, M. D., and John A. Kolmer, M. D.

CVI. September 8.

A Plea for Early Diagnosis of Pulmonary Tuberculosis. S. A. Silk, M. D.

CVI. September 15.

Hygiene of Rural Schools (to be concluded). J. A. Nydegger, M. D.

U. S. Public Health Reports.

XXXII. August 10.

Poliomyelitis (Infantile Paralysis) Situation.
Typhoid Fever at Nashville, Tenn.
Extra Cantonment Zone Regulations—Regulations Governing the Sale of Food and Drink in the Special Sanitary Zone around Camp Pike, near Little Rock, Ark.

XXXII. August 17.

Certain Military Aspects of Hookworm Disease.
Malaria in Eastern Texas—Prevalence and Geographic Distribution.
Typhoid Fever—Epidemic at Charleston, W. Va., April–June, 1917.

XXXII. August 24.

Poliomyelitis (Infantile Paralysis)—Its Present Prevalence in the United States.
Malaria in Tennessee—Prevalence and Geographic Distribution.
The Notifiable Diseases.

XXXII. August 31.

Poliomyelitis in Chosen (Korea).
The Malaria Parasite in the Mosquito—The Effects of Low Temperature and Other Factors on its Development.

XXXII. September 7.

Tetanus in Court-Plaster.
Rodent Destruction on Ships—A Report on the Relative Efficiency of Fumigants as Determined by Subsequent Intensive Trapping over a Period of One Year.
Tetanus in Court-Plaster—Results of the Bacteriological Examination of Fourteen Specimens.

BRITISH.

Journal of State Medicine.

XXV. August, 1917.

The Hygiene of Occupation in War Time. Prof. Thomas Oliver.
Mental States and the War—The Psychological Effects of Fear. Maj. Robert Armstrong-Jones, M. D.

The Medical Officer.

XVIII. August 4.

Relation of Infant Mortality to Subsequent Mortality. Editorial.
Milk and Communicable Disease. Linsly R. Williams, M. D.

XVIII. August 11.

Report on Child Mortality. Editorial.
The Present Status of the Schick Test and Active Immunization with Diphtheria Toxin-Antitoxin (concluded in August 18 issue). Abraham Zingher.

XVIII. August 18.

Feeding a Nation. Editorial.
Present Status of the Schick Test (concluded).

XVIII. August 25.

L. G. B. Housing Enquiry. Editorial.
The Carnegie Infant Welfare Scheme. Editorial.

XVIII. September 1.

The B. M. A. and the Ministry of Health. Editorial.
Public Health and the Disposal of the Dead. Duncan Forbes, M. D.

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Washington, D. C., October 17–20, 1917

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Secretary, Mr. Chester Wells, Montclair, N. J.

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Chairman, Dr. John W. Trask, Washington, D. C.
Vice-Chairman, Mr. W. J. V. Deacon, Topeka, Kansas.
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Chairman, Mr. Theodore Horton, Albany, N. Y.
Vice-Chairman, Mr. George S. Webster, Philadelphia, Pa.
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Secretary, Dr. Louis I. Harris, New York, N. Y.

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Vice-Chairman, Dr. G. M. Price, New York, N. Y.
Secretary, Dr. J. W. Schereschewsky, Pittsburgh, Pa.

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Secretary, Dr. James O. Jordan, Boston, Mass.

Health Association

The Dominion of Canada
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1917

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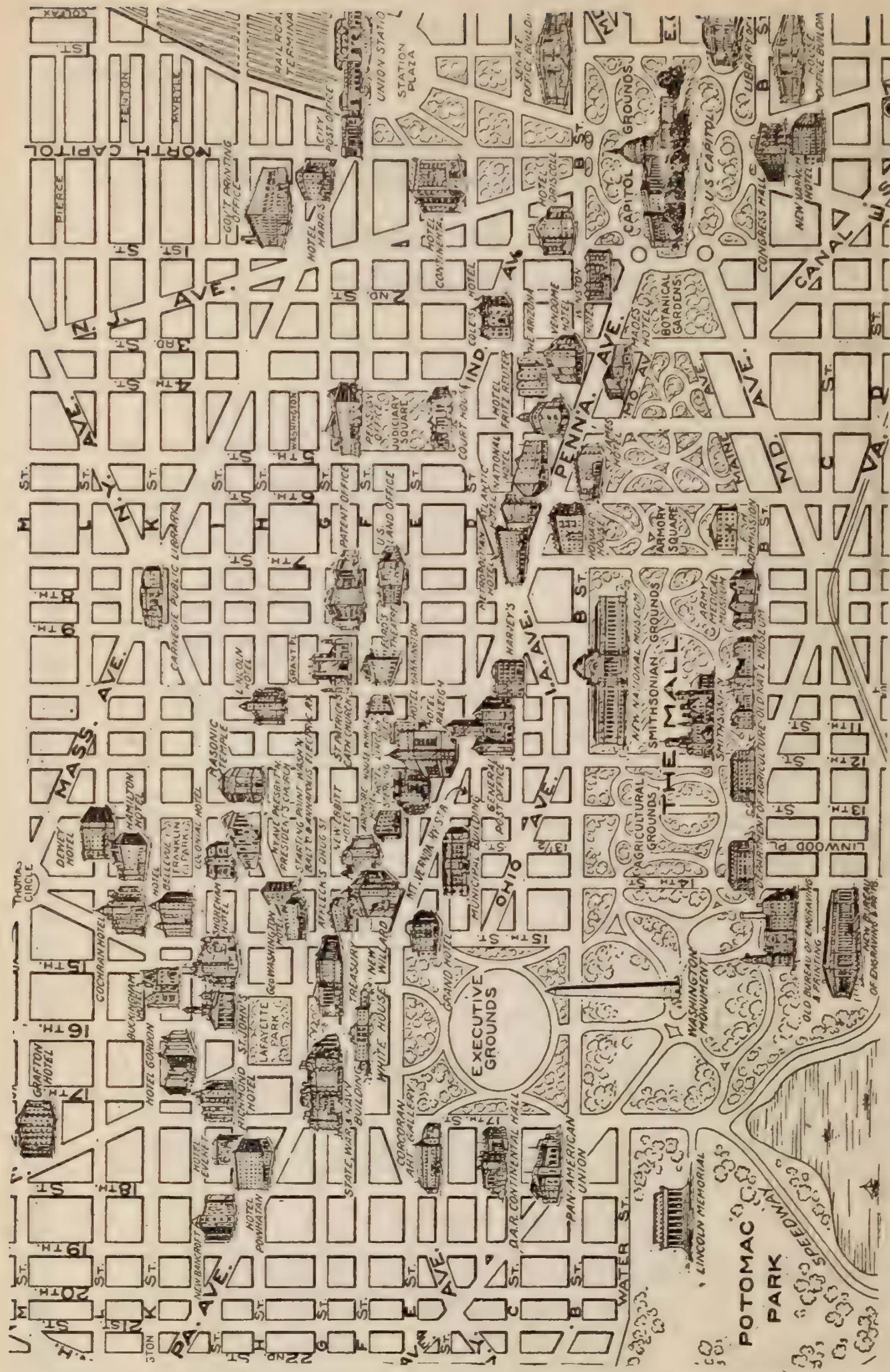
Vital Statistics: Dr. William H. Guilfoy, New York, N. Y.
Sanitary Engineering: Mr. Theodore Horton, Albany, N. Y.
Sociological: Dr. W. F. Snow, New York, N. Y.
Industrial Hygiene: Dr. Alice Hamilton, Chicago, Ill.



Map of Washington, D. C.

IMPORTANT ANNOUNCEMENT REGARDING HOTELS.

On September 22, inquiry was made of twenty-five Washington hotels regarding available accommodations. Of sixteen replies received, the New Willard, Raleigh, Harrington, and Capitol Park report that they are completely booked for October 17–20.

The New Ebbitt has no single rooms, but could accommodate quite a number in double rooms.

Bellevue: "Unable to promise, but will do our best upon arrival."

St. James: "Cannot guarantee a great number, but will give requests immediate attention."

Sterling: "Only a small number of rooms, but will try to oblige."

National: "Don't know. Send your people and we will try to take care of them."

Dewey: "About 20 rooms."

Congress Hall: "30 to 60. If Congress adjourns, from 100 to 150."

George Washington Inn: "About 10 double rooms."

Continental: "About 25."

Atlantic and Bancroft: "8 or 10."

LaFayette: "Cannot promise, but will try to take care of you."

Metropolitan: "Will be pleased to take care of all reservations made."

A more complete list of hotels is given in the September Journal.

In reserving accommodations, state whether a single or double room is wanted. Prospects seem best in the case of double rooms. Also indicate whether bath is demanded.

Mr. Thomas Grant, of the Chamber of Commerce, Washington, D. C., has kindly offered to fill the requirements of prospective guests who write to him. In writing, please enclose a stamped envelope for reply, state the price you wish to pay, and give the other information referred to above.

Some members will choose to reserve accommodations in Baltimore hotels, which are not so crowded. It is quite likely, also, that Mr. Grant will be able to arrange with dormitories, or private rooming houses.

If Congress adjourns before October 17,—and that seems highly probable,—more rooms will be available. At any rate, the necessity is apparent of applying for reservations at once.

HEADQUARTERS.

Headquarters will be on the Mezzanine Floor of the New Willard Hotel. All guests are requested to register, whether members or not. Programs for all, and badges for members will be given out upon registration. Announcements will also be posted here, and descriptive booklets regarding the places of interest in Washington will be presented to guests.

Wednesday morning, October 17, has been especially set aside for registration, although Headquarters will be open throughout the Sessions.

EXHIBITS.

Commercial exhibits will be found in and near the Crystal Room of the New Ebbitt Hotel. Prospective exhibitors are directed to the manager of the Hotel for space and rates.

A WORD OF CAUTION.

At the last Annual Meeting of the Association several members were swindled by cashing checks for a wily stranger. Our members are cautioned. Courtesy always; but safety first!

PUNCTUALITY.

All meetings will begin at 9:00 A. M., 2:00 P. M., and 7:45 P. M. Members and guests are earnestly requested to arrive five minutes before, rather than after the stated time for opening meetings. Tardiness is an imposition upon both audience and speaker.

ADVISORY COUNCIL.

Attention is drawn to the following extracts from Constitution and By-Laws concerning the Advisory Council:

Article V. Constitution.

Advisory Council. Nominations of officers and directors shall be made by an Advisory Council. The Advisory Council shall consist of one representative from each state, province, territory, or district; one from each army and navy medical and hygienic board; and one from each federal department or bureau of the nations represented in the Association, dealing with phases of public health; together with one representative not otherwise eligible, to be elected annually by each section of the Association. Provided, that this article shall not be construed to deprive any member of the Association of his right to make nominations.

Article 2. By-Laws.

ADVISORY COUNCIL.

Each member of the Advisory Council representing a state, province, territory or district shall be elected by the members of the Association resident in the jurisdiction which he represents, either before or at the annual meeting. His election shall be reported in writing to the secretary, and he shall hold office until the next annual meeting and until his successor is elected. In the event of the failure of any such jurisdictional group so to report, the executive committee shall appoint a representative *pro tem.*

In accordance with the foregoing, on Thursday at noon, after the address of Mr. Hoover, members will group themselves in the Small Ball Room at the New Willard, in order to elect representatives to the Advisory Council.

The Advisory Council will meet in the Onyx Room, New Ebbitt Hotel, on Friday, October 19, and there choose nominees for the offices of president, three vice-presidents, treasurer, and ten directors.

BOARD OF DIRECTORS.

The Board of Directors consists of the officers, all ex-presidents, a member designated annually by each section, and thirty additional directors, who serve for three years. Ten of these are elected by the Association each year.

The administrative affairs of the Association are entrusted to this body. In Washington the Board of Directors will have three important sessions on Wednesday, October 17, at 9:00 A. M., 2:00 P. M., and at 7:45 P. M. As business of the most vital importance to the Association will be taken up, President Evans asks that all directors attend these meetings without fail.

ENTERTAINMENT OF LADIES.

For the ladies, the special entertainment feature will be an automobile ride through the parks, followed by a luncheon.

CHANGES IN PROGRAM.

In order that this number of the JOURNAL might appear promptly, it was necessary to send the forms to press several days earlier than was originally expected. The final program to be issued at the meeting will have a number of changes and additions.

PROGRAM OF THE GENERAL SESSIONS.

FIRST SESSION.

Thursday, October 18, 11:30 A. M.
New Willard Hotel, Small Ball Room.

All Sections will adjourn at 11:25 A. M. in order to enable the members to assemble for this general session.

Address. HERBERT C. HOOVER, *Director, U. S. Food Administration.*

Election of Advisory Council.

After this address the members will group themselves in this room by States, Provinces, and Districts in order to select their respective members to the Advisory Council. The elected members should be reported in writing to the Secretary at headquarters not later than Thursday at 3:00 P. M.

Vacancies in the Advisory Council at 3:00 P. M. on Thursday, October 18, will be filled *pro tempore*, by the Executive Committee in accordance with the by-laws of the Association.

The Advisory Council will meet on Thursday, October 18, at 5:00 P. M., in order to make nominations for a president, three vice-presidents, and a treasurer. These nominations will be acted upon by the Association at its final session, Saturday, October 20, at 2:00 P. M.

SECOND SESSION.

Thursday, October 18, 7:45 P. M.
New National Museum, Auditorium.

Presidential Address. DR. W. A. EVANS.

Address. W. C. GORGAS, *Surgeon-General, U. S. A.*

Address. W. C. BRAISTED, *Surgeon-General, U. S. N.*

Address. DR. FRANKLIN H. MARTIN, *Chief of Medical Commission, Council of National Defense.*

Address. DR. W. H. FROST, *Director, Bureau of Sanitary Service, American Red Cross.*

A reception will follow these addresses.

All papers positively limited to 15 minutes; discussion to 5 minutes.

THIRD SESSION.

Friday, October 19, 9:00 A. M.
New Willard Hotel, Small Ball Room.

Under the Auspices of the Sociological Section.

Important Medical Problems of the World War.

Tuberculosis and the War. DR. HERMANN M. BIGGS, *Commissioner of Health of New York State; Member of the General Medical Board of the Council of National Defense.*

Venereal Diseases and the War. W. C. GORGAS, *Surgeon-General, U. S. A.*

The Rehabilitation and Reëducation of Diseased and Injured Soldiers. MAJOR-GENERAL JOEL E. GOLDTHWAITE, *of the Surgeon-General's Staff.*

FOURTH SESSION.

Friday, October 19, 7:45 P. M.
New National Museum, Auditorium.

Sanitation in the Forward Areas in the War. COL. T. H. GOODWIN, *C. M. G., D. S. O., R. A. M. C., of the English Army.*

Address. J. W. TRASK, *Assistant Surgeon-General, U. S. P. H. S.*

Army Sanitation. SURGEON-MAJOR EDOUARD RIST, *French Scientific Mission.*

War and Mental Diseases. MAJOR PEARCE BAILEY, *U. S. A.*

War Sanitary Problems in Canada. MAJOR J. W. S. MCCULLOUGH, *Chief Officer of Health, Provincial Board of Health, Toronto, Ontario.*

FIFTH SESSION (FINAL).

Saturday, October 20, 2:00 P. M.
New National Museum, Auditorium.

Election of Association Officers.

Ten-minute Résumés of Section Chairmen Relative to Section War Conferences and Important Papers Read in Section Meetings.

Maintaining the Health of British Soldiers. COL. GEO. B. NASMITH, *Canadian Expeditionary Force.*

Report of Committee on Social Insurance.

Report of Committee on Public Health Education. DR. MARK F. BOYD.

Report of the Committee on Cold Storage.

Report of the Committee on Regulations Concerning the Production and Sale of Milk.

All papers positively limited to 15 minutes; discussion to 5 minutes.

PROGRAM OF THE SECTION ON PUBLIC HEALTH ADMINISTRATION.

Chairman, Dr. E. C. Levy, *New York City.*
Vice-Chairman, Dr. Francis G. Curtis, *West Newton, Mass.*
Secretary, Chester H. Wells, *Montclair, N. J.*

First Session.

Wednesday, October 17, 2:00 P. M.
New Willard Hotel, Small Ball Room.

Minutes of last annual meeting.

Introduction of new business to be considered by the section before final adjournment.

Appointment of nominating committee.

Report of Committee on Standardizing the Work of Public Health Officials. Dr. James F. McCrudden, *Philadelphia, Pa.*

Symposium on Rural Health Administration.

Statistical Evidence on the Need of Efficient Rural Health Administration. Dr. Frederick L. Hoffman, *Newark, N. J.*

Discussion (five minutes): Opened by Dr. John T. Black, *Hartford, Conn.;* Dr. Samuel J. Crumbine, *Topeka, Kan.;* Dr. L. L. Lumsden, *Washington, D. C.*

Rural Health Administration under the State Health District Plan. Dr. Frederick W. Sears, *Syracuse, N. Y.*

Discussion (five minutes): Opened by Dr. Charles E. Simpson, *Lowell, Mass.*

Rural Health Administration under the Coöperative and Local Health District Plan. Dr. G. F. Ruediger, *La Salle, Ill.*

Discussion (five minutes): Opened by Mr. Robert N. Hoyt, *San Jose, Cal.*

The Evolution of County Health Work. Dr. W. S. Rankin, *Raleigh, N. C.*

Discussion (five minutes): Opened by Dr. John A. Ferrell, *New York City.*

Coöperation in City, State and Federal Food and Drug Control. Dr. Carl W. Alsberg, *Washington, D. C.*

Discussion (five minutes): Opened by Dr. R. B. Fitz Randolph, *Trenton, N. J.;* Dr. H. E. Barnard, *Indianapolis, Ind.*

Hay Fever Prevention as a National Problem. Dr. W. Scheppegrell, *New Orleans, La.*

Second Session.

Thursday, October 18, 2:00 P. M.
New Willard Hotel, Small Ball Room.

WAR PROGRAM.

Joint Meeting with the American Social Hygiene Association and the Sociological Section of A. P. H. A.

All papers positively limited to 15 minutes; discussion to 5 minutes.

Chairman's Address. Some Public Health Problems of the Present War. Dr. E. C. Levy, *New York City.*

Report of Committee on Venereal Diseases. Dr. W. F. Snow, *New York City.*

Symposium on Venereal Disease Control in the Army, the Navy, and the Civilian Community.

Colonel F. F. Russell, *U. S. A.*
Surgeon Richmond Holcomb, *U. S. N.*
Mr. Raymond B. Fosdick, *Commission on Training Camp Activities.*
Assistant Surgeon-General J. W. Kerr, *U. S. P. H. S.*
Dr. Wade H. Frost, *Director of the Red Cross Sanitary Service.*

Theory and Practice in Vital Statistics. Dr. T. D. Tuttle, *Seattle, Wash.*

Discussion (five minutes): Opened by Dr. Knud Stoumann, *Newark, N. J.*

Report of Nominating Committee.

Third Session.

Friday, October 19, 2:00 P. M.
New National Museum, Auditorium.

Report of Committee to Formulate Minimum Requirements for the Control of the Common Communicable Diseases. Dr. Haven Emerson, *New York City.*

(This committee has done a large amount of work during the year and its report should be of the greatest interest to every health official. At least one hour will be given to the discussion of this report.)

Report of Committee on Rural Health Administration. Dr. Gustav F. Ruediger, *La Salle, Ill.*

Other Committee Reports.

A Tuberculosis Survey in Chicago. Dr. J. D. Robertson, *Health Commissioner, Chicago, Ill.*

What We Are Doing to Prevent Tuberculosis Among Children. Address by a representative of the New York City Department of Health.

Discussion (five minutes): Opened by Dr. Francis X. Mahoney, *Boston, Mass.;* Dr. Francis E. Fronczak, *Buffalo, N. Y.;* Dr. Charles J. Hastings, *Toronto, Can.;* Dr. John H. Landis, *Cincinnati, Ohio;* Dr. J. D. Robertson, *Chicago, Ill.*

Note.—Every health officer who has any suggestion to make should consider it his duty to take part in this important discussion, so that all members of the Section may be stimulated to take every known step to combat this disease.

Symposium on Public Health Publicity and Education.

Publicity in Health Matters a Public Right. Dr. Oscar W. Dowling, *New Orleans, La.*

The Health Department and the Citizen. Publicity as a Factor in Their Better Coöperation. Dr. John W. Trask, *Washington, D. C.*

Public Health Publicity and Education through the Public Schools. Dr. Ira S. Wile, *New York City.*

Moving Pictures in Health Education. Dr. Charles F. Bolduan, *New York City.*

FOURTH SESSION.

Saturday, October 20, 9:00 A. M.
New Ebbitt Hotel, Crystal Room.

Committee reports.
Round table discussion.
Five-minute speeches.
Election of officers.

Camp Sanitation. MAJOR FITZGERALD, *Toronto, Can.*

The Red Cross as a Public Health Agency. DR. W. H. FROST, *Washington, D. C.*

My Most Interesting Experience as a Public Health Officer.
Discussion (five minutes): Opened by DR. CHARLES J. HASTINGS, *Toronto, Can.;* DR. CARL E. BUCK, *Oak Park, Ill.;* DR. CHAS. V. CHAPIN, *Providence, R. I.;* DR. ARCHABALD CHEATHAM, *Durham, N. C.;* DR. JAMES C. COFFEY, *Worcester, Mass.;* MR. MAX J. COLTON, *Cumberland, Md.;* DR. CHAS. V. CRASTER, *Newark, N. J.;* DR. FRANCIS E. FRONCZAK, *Buffalo, N. Y.;* DR. GEORGE W. GOLER, *Rochester, N. Y.;* DR. JOHN H. LANDIS, *Cincinnati, Ohio;* DR. FRANCIS X. MAHONEY, *Boston, Mass.;* DR. JOHN D. ROBERTSON, *Chicago, Ill.;* DR. P. S. SCHENCK, *Norfolk, Va.;* DR. FRANK W. WRIGHT, *New Haven, Conn.*

My Most Interesting Experience in Connection with Public Health Work.
Discussion: Opened by DR. JOS. GOLDBERGER, *Washington, D. C.;* MR. LUCIUS P. BROWN, *New York City;* DR. S. J. CRUMBINE, *Topeka, Kan.;* DR. A. J. DOUGLAS, *Winnipeg, Can.;* DR. J. N. HURTY, *Indianapolis, Ind.;* DR. S. L. JEPSON, *Charleston, W. Va.;* DR. GRACE L. MEIGS, *Washington, D. C.;* DR. F. MONTIZAMBERT, *Ottawa, Can.;* DR. CHARLES E. NORTH, *New York City;* DR. HERBERT D. PEASE, *New York City;* DR. W. A. SAWYER, *Sacramento, Cal.*

PROGRAM OF THE SECTION ON INDUSTRIAL HYGIENE.

Chairman, DR. E. R. HAYHURST, *Columbus, Ohio.*
Vice-Chairman, DR. G. M. PRICE, *New York City.*
Secretary, DR. J. W. SCHERESCHEWSKY, *Pittsburgh, Pa.*

FIRST SESSION.

Wednesday, October 17, 2:00 P. M.
New Ebbitt Hotel, White Parlor.

Committee report.

The Need for a General System of Sanitary Supervision of Industries in Times of War. DR. E. R. HAYHURST, *Columbus, Ohio.*

General Measures for the Prevention and Control of Industrial Diseases in War Industries. DR. ALFRED STENGEL.

Plan for Coöperation of Federal and State Authorities in the Sanitation of Industries. DR. FRANCIS D. PATTERSON, *Harrisburg, Pa.*

Practical Standards for Factory Sanitation. DR. G. M. PRICE, *New York City.*

All papers positively limited to 15 minutes; discussion to 5 minutes.

SECOND SESSION.

Thursday, October 18, 9:00 A. M.
New Ebbitt Hotel, White Parlor.

Committee report.

Community Sanitation in Time of War. DR. GEORGE M. KOBER, *Washington, D. C.*

Necessary Standards of Medical Supervision in Maintaining the Health of Employees. DR. OTTO P. GEIER, *Cincinnati, Ohio.*

Prophylaxis of Industrial Poisoning in the Munitions Industries. DR. ALICE B. HAMILTON, *Chicago, Ill.*

Practical Points in the Safe Handling of T. N. T. and Allied Explosives. DR. W. G. HUDSON.

Industrial Toxic Jaundice. DR. J. W. SCHERESCHEWSKY, *Pittsburgh, Pa.*

(This meeting will close promptly at 11.25 A. M. to permit members to hear Mr. Hoover and to attend the election of the Advisory Council at the New Willard Hotel, Small Ball Room.)

THIRD SESSION.

Thursday, October 18, 2:00 P. M.
New Ebbitt Hotel, White Parlor.

Election of officers.

Committee report.

Practical Standards of Factory Illumination. L. B. MARKS.

Standards for the Prevention of Compressed Air Illness. SEWARD ERDMAN.

Heating and Ventilating Standards. D. D. KIMBALL, *New York City.*

Practical Standards for the Ventilation of the Air of Workrooms. MISS J. J. LYLE, *Lexington, Ky.*

Method of Counting Dust and Synthetic Air Chart for Ventilation Determinations. DR. E. V. HILL, *Chicago, Ill.*

FOURTH SESSION.

Friday, October 19, 2:00 P. M.
New Willard Hotel, Small Ball Room.

Joint Meeting with the Sociological Section.

Considerations Affecting the Replacement of Men by Women in War Industries. JOSEPHINE GOLDMARK.

Industrial Fatigue,—Its Relation to War Industries, Some Methods for Its Reduction· PROF. FREDERIC S. LEE.

Methods for Field Study of Industrial Fatigue. P. SARGENT FLORENCE.

The Status of our Knowledge in Regard to Fatigue "Toxins." PROF. ERNEST L. SCOTT, *Columbus, Ohio.*

The Heat Hazard, Methods for its Mitigation. J. A. WATKINS, *P. A. Surgeon, U. S. P. H. S.*

Conference on War Problems and Opportunities.

FIFTH SESSION.

Saturday, October 20, 9:00 A. M.
New Willard Hotel, Small Ball Room.

A round table discussion by representatives of manufacturers in the explosives and munitions industries, concerning the conservation of the health of workers, under the auspices of the Committee on Sanitation of the Advisory Committee on Labor, National Council of Defense.

This will probably be followed by a luncheon in the same room. Tickets may be obtained on Friday at the Headquarters.

PROGRAM OF THE LABORATORY SECTION.

Chairman, PROF. HENRY ALBERT, *Iowa City, Iowa.*
Vice-Chairman, DR. D. L. HARRIS, *St. Louis, Mo.*
Secretary, DR. CHAS. KRUMWIEDE, JR., *New York City.*

FIRST SESSION.

Thursday, October 18, 2:00 P. M.
New National Museum, Auditorium.

Chairman's Address. Service of Health Laboratories in Time of War. HENRY ALBERT, *Iowa City, Iowa.*

War Activities of the Bacteriological Laboratories in France and England. WM. H. PARK, *New York City.*

The Work of a Mobile Army Laboratory in France. COL. GEO. F. NASMITH, *Canadian Expeditionary Force, Toronto, Can.*

Experimental Work on the Comparative Value of Dakin's Solution and Tincture of Iodine. H. D. PEASE, *New York City.*

Studies of a Regimental Epidemic of Bacillus Paratyphosis with Special Reference to the Efficient Disposal of Large Numbers of Specimens. MARY NEVIN, *Albany, N. Y.*

Experiences with the New Standard Methods of Water Examination. H. E. HAZELTINE, *Washington, D. C.*

Report of the Committee on Bacterial Methods for the Examination of Water.

The Preparation of Typhoid and Paratyphoid Vaccines as Used in the United States Army. GUTHRIE MCCONNELL, *Washington, D. C.*

SECOND SESSION.

Friday, October 19, 9:00 A. M.
New Ebbitt Hotel, Crystal Room.

Committee reports.

Fecal Examination for Typhoid and Paratyphoid Bacilli with Special Reference to Normal or Contact Carriers. CHAS. KRUMWIEDE, JR., *New York City.*

All papers positively limited to 15 minutes; discussion to 5 minutes.

Effect of Concentration of Glucose and Lactose on the Viability of the Colon-cloacæ Group. MAX LEVINE and HELEN A. BURLING, *Ames, Iowa.*

Differentiation of B. Coli and B. Aerogenes on Solid Media. MAX LEVINE, *Ames, Iowa.*

Results of Work on Poliomyelitis. E. C. ROSENOW, *Rochester, Minn.*

Technique of Demonstration and Isolation of Tetanus Bacilli. J. P. LEAKE, *Washington, D. C.*, and H. B. CORBITT, *Washington, D. C.*

The Sanitary Significance of Chemical Determinations in the Analysis of Water from Wells and Springs to be Used for Drinking Purposes. W. D. STOVALL, *Madison, Wis.*

The Influence of Plankton Animals upon Bacterial Death Rates. (Illustrated with lantern slides.) W. C. PURDY, *Plankton Expert, U. S. P. H. S.*, and C. T. BUTTERFIELD, *Sanitary Bacteriologist, U. S. P. H. S.*

Final Report of Committee on Bacterial Methods of Milk Analysis. (For Discussion and Adoption.)

THIRD SESSION.

Saturday, October 20, 9:00 A. M.
New National Museum, Auditorium.

Committee reports.

Election of officers.

Comparative Wassermann Tests with Two Antigens. ANNA I. VANSAUN and MARGARET K. PRESTON, *Albany, N. Y.*

A Method for the Colorimetric Estimation of Small Amounts of Aniline. ELIAS ELVOVE, *Washington, D. C.*

American Pellagra Mortality During 1915 and 1916. WM. F. PETERSON, *Chicago, Ill.*

Standardization of Disinfectants. ARTHUR L. WALTERS, *Indianapolis, Ind.*

Final Report by the Committee on Standardization of Disinfectants.

The Possible Application of the Macroscopic Slide Agglutination in the Search for Meningococcus Carriers. CHAS. KRUMWIEDE, JR., *New York City.*

The Hydrogen Ion. EARLE B. PHELPS, *Washington, D. C.*

Hydrogen Ion Concentration and Toxigenicity of B. Diphtheriæ. LEWIS DAVIS, *Detroit, Mich.*

The Mobile Unit of the Laboratory of the New York State Department. AUGUSTUS B. WADSWORTH, *Albany, N. Y.*

Notes on an Epidemic of Bacillary Dysentery. AUGUSTUS B. WADSWORTH, *Albany, N. Y.*

Standardization of Anti-Typhoid Vaccine. G. W. MCCOY, *Washington, D. C.*

All papers positively limited to 15 minutes; discussion to 5 minutes.

PROGRAM OF THE SECTION ON SANITARY ENGINEERING.

Chairman, Mr. Theodore Horton, *Albany, N. Y.*
Vice-Chairman, Mr. Geo. S. Webster, *Philadelphia, Pa.*
Secretary, Dr. H. D. Pease, *New York City.*

Thursday, October 18, 2:00 P. M.
New Ebbitt Hotel, Red Parlor.

Committee on Air Supplies. Dr. Frederic H. Bass, *Chairman.*

Committee on Sewerage and Sewage Disposal. Mr. George S. Webster, *Chairman.*

Committee on Sanitary Control of Waterways. Mr. Harrison P. Eddy, *Chairman.*
  a. Fundamental Principles of Sanitary Control of Waterways.
  b. Code of Regulations for the Sanitary Control of Waterways.

Committee on Refuse Collection and Disposal. Mr. Samuel A. Greeley, *Chairman.* Also the following papers:
  a. Relation of State Health Departments to Municipal Refuse Collection and Disposal. Mr. Edward D. Rich.
  b. Effect of the War on the Production of Garbage and the Methods of Disposal. Mr. I. S. Osborne.

Committee on Works Operation and Analytical Methods. Mr. Wm. L. Stevenson, *Chairman.*

Committee on Plumbing and Drainage of Buildings. Preliminary Report. Mr. Chester H. Wells, *Chairman.*

Some Conclusions Reached Concerning the Treatment of Sewage by the Activated Sludge Process. Mr. T. Chalkley Hatton.

Mosquito Control in New Jersey under the County Commission Law. Dr. Ralph H. Hunt.

Notes on Activated Sludge, with Particular Reference to Treatment of Packingtown Wastes. Mr. Langdon Pearse.

The Ventilation of Army Barracks. Mr. W. J. Mauer, *Chicago, Ill.*

PROGRAM OF THE SECTION ON VITAL STATISTICS.

Chairman, Dr. John W. Trask, *Washington, D. C.*
Vice-Chairman, Dr. W. J. V. Deacon, *Topeka, Kan.*
Secretary, R. C. Lappin, *Washington, D. C.*

(There will be a special meeting of the section to consider the new problems in connection with the registration of births and deaths and the notification of disease brought about by our entrance into the war.)

All sessions to be held at the New Ebbitt Hotel in the Red Drawing Room.

First Session.

Wednesday, October 17, 2:00 P. M.

Morbidity Reports and Records of the Army. Col. F. P. Reynolds, *U. S. Army.*

Morbidity Reports and Records of the Navy. Surgeon J. R. Phelps, *U. S. Navy.*

Morbidity Reports and Records of Extra Cantonment Zones. ASSISTANT SURGEON-GENERAL JOHN W. TRASK, *U. S.*

Deaths from Puerperal Causes. W. J. V. DEACON.

The Significance of "Standardized" or "Corrected" Death-Rates. WALTER F. WILCOX.

Election of Nominating Committee.

Report of the Committee on Membership. CHARLES F. BOLDUAN.

Report of the Committee on the Accuracy of Certified Causes of Death and Its Relation to Mortality Statistics and the International List. HAVEN EMERSON, *Chairman.*

SECOND SESSION.

Thursday, October 18, 9:00 A. M.

Report of Nominating Committee and Election of Officers and Section Council.

Notification of Disease and the Protection of the Troops—What the Several State Health Departments are Doing to Prevent the Spread of Disease during Mobilization. Report of the Committee on Morbidity Reports and Statistics. A. J. CHESLEY, *Chairman.*

The Need for Morbidity Statistics of War Industries. B. S. WARREN.

What a System of Good Hospital Morbidity Statistics would Accomplish in the Study of Maternal Mortality and Puerperal Sepsis Considered as a Public Health Problem. BARTON COOKE HIRST.

Hospital Statistics as an Aid in Public Health Administration—The Philadelphia Plan. CHARLES SCOTT MILLER.

The Need for Comparable Morbidity Statistics of Penal Institutions. EDWIN W. KOPF.

Uniform Statistics of Mental Diseases. HORATIO M. POLLOCK.

Report of Committee on Institutional and Hospital Statistics. FREDERICK L. HOFFMAN, *Chairman.*

(The meeting will close promptly at 11:25 A. M., in order to permit members to hear Mr. Hoover at the New Willard Hotel, Small Ball Room, and to assemble for the election of the Advisory Council.)

THIRD SESSION.

Friday, October 19, 2:00 P. M.

Comparability—The Mortality Statistics Will O' the Wisp. GEORGE H. VANBUREN.

A Proposal for the Promotion of Vital Statistics Education in the United States. EDWIN W. KOPF.

Report of the Committee on the 1920 Census and Its Relation to Vital Statistics. WM. H. GUILFOY.

Report of the Committee on Legislation. C. V. CHAPIN.

Report of the Committee on Forms and Methods of Statistical Practice. WALTER F. WILLCOX, *Chairman.*

Report of the Committee on Investigations in Registration and Vital Statistics Problems. WILMER R. BATT, *Chairman.*

All papers positively limited to 15 minutes; discussion to 5 minutes.

Report of the Committee on Constitution. Charles F. Bolduan.

Report of Committee on Non-Resident Deaths. Wilmer R. Batt, *Chairman.*

Fourth Session.

Saturday, October 20, 9:00 A. M.

Report of Section Council and Nomination of Standing Committees for Ensuing Year.

Reports of other committees.

Pellagra Experience.

Report of Committee on the Accuracy of Certified Causes of Death and Its Relation to Mortality Statistics and the International List (concluded from First Session). Haven Emerson, *Chairman.*

Report of Committee on Amendments to the Standard Certificate of Death. W. H. Davis, *Chairman.*

Unfinished business.

PROGRAM OF THE SOCIOLOGICAL SECTION.

Chairman, Dr. Donald B. Armstrong, *Framingham, Mass.*
Vice-Chairman, Dr. William F. Snow, *Washington, D. C.*
Secretary, Dr. Lois I. Harris, *New York City.*

First Session.

Thursday, October 18, 2:00 P. M.

Joint Session with Public Health Administration Section. See program on page 891.

Second Session.

Friday, October 19, 9:00 A. M.
New Willard Hotel, Small Ball Room.

A General Session under the auspices of Sociological Section. See the program on page 890.

Third Session.

Friday, October 19, 2:00 P. M.
New Willard Hotel, Small Ball Room.

Joint Session with Industrial Hygiene Section. See page 894 for program.

Fourth Session.

Saturday, October 20, 9:00 A. M.
New Ebbitt Hotel, White Parlor.

CONFERENCE ON WAR PROBLEMS AND OPPORTUNITIES.

Report of committees.

Conference on War Problems and Opportunities.

Election of officers.

All papers positively limited to 15 minutes; discussion to 5 minutes.

PROGRAM OF THE FOOD AND DRUGS SECTION.

Chairman, Mr. Lucius P. Brown, *New York City.*

First Session.

Thursday, October 18, 9:00 A. M.
New Ebbitt Hotel, Crystal Room.

Reports of Committees on: Nutritional Problems; Relation of Foods to Disease; Control of Milk and Dairy Products.

Problem of Increased Production of Milk and Dairy Products. Prof. Fred. E. Rasmussen, *Pennsylvania State College, Philadelphia, Pa.*

Maintenance of Economy and Quality in Distributing Market Milk. Mr. Loton Horton, *Pres., Sheffield-Farms, S. D. Milk Co., New York City.*

Influence of Heat on Growth-Promoting Properties of Food. Dr. E. V. McCollum, *Johns Hopkins University, Baltimore, Md.*

Bacterial Contamination of Foods from Exposure to Dust. Dr. Wm. E. Park, *Director, Bureau of Laboratories, Department of Health, City of New York.*

(The meeting will close promptly at 11:25 A. M., in order to permit members to hear Mr. Hoover at the New Willard Hotel, Small Ball Room, and to assemble for the election of the Advisory Council.)

Second Session.

Friday, October 19, 2:00 P. M.
New National Museum Auditorium.

Symposium on Foods and Drugs as Related to War Problems.

Reports of Committees on: Cold Storage; Problems of Canning; Retail Distribution and Marketing of Foods; Conservation and Development of Food Supplies; Preparation, Packing and Transportation of Foods.

Address of Chairman. What Our Members Can Do.

Cold Storage—Its Capabilities and How to Best Utilize and Extend Them Mr. Frank A. Horne, *Pres., Merchants Refrigerating Co., New York City.*

The Present Status of the Preservation of Foods by Canning and the Possibilities of Increase. Mr. F. S. Gorrell, *Sec., National Canners' Assn., Washington, D. C.*

War-Time Foods from Poultry and How Production May Be Increased. Dr. Raymond Pearl, *U. S. Food Administration, Washington, D. C.*

Fruits in War-Time; Their Distribution and the Possible Greater Development of Production. Mr. G. H. Powell, *U. S. Food Administration, Washington, D. C.*

Cereal Production, Distribution and Conservation. Dr. W. A. Taylor, *Chief, Bureau of Plant Industry, U. S. Dept. of Agriculture, Washington, D. C.*

All papers positively limited to 15 minutes; discussion to 5 minutes.

THIRD SESSION.

Saturday, October 20, 9:00 A. M.
New National Museum, Committee Room.

Reports of Committees on: Municipal Food Administration; Drugs and Nostrums; Meat Inspection; Habit-Forming Drugs.

Election of Section Officers.

The Duty of Municipal Food Departments in Modern War. MR. OLE SALTHE, *Asst. Director, Bureau of Food and Drugs, Department of Health, City of New York.*

The Nostrum Fakir and the Soldier. MR. JOHN PHILLIPS STREET, *Chemist in Charge, Analytical Laboratory, Agricultural Experiment Station, New Haven, Conn.*

Drug Diseases and Wars. DR. EDWARD GUION, *Atlantic City, N. J.*

NOTE.—Other papers have been requested and will appear on final program.

The North Atlantic Tuberculosis Conference will be held at Baltimore, October 17–18. Secretary, Dr. Philip P. Jacobs, 105 East 22nd Street, New York City. Our members are invited to attend.

The A. A. S. P. of Infant Mortality Convention meets at Richmond, Va., October 15–17. Executive Secretary, Gertrude B. Knipp, 1211 Cathedral Street, Baltimore, Md. A. P. H. A. members are invited to attend.

OUR NATIONAL CAPITOL

The seat of government for one hundred million people. Seventy-four years in process of construction, cost over sixteen million dollars, covers nearly four acres. Dome of cast iron, weighs forty-five hundred tons. Building contains Senate Chamber and House of Representatives, President's, Vice-President's, and Speaker's Rooms, Hall of Statues, and Committee Rooms.

TABULAR VIEW OF ALL MEETINGS.

SESSIONS	Wednesday, Oct. 17			Thursday, Oct. 18			Friday, Oct. 19			Saturday, Oct. 20	
	9:00 A. M.	2:00 P. M.	7:45 P. M.	9:00 A. M.	2:00 P. M.	7:45 P. M.	9:00 A. M.	2:00 P. M.	7:45 P. M.	9:00 A. M.	2:00 P. M.
General Sessions	Registration—New Willard Hotel, Mezzanine Floor		Committee Meetings	I Willard* S. B. R. 11:30 A. M.		II Nat'l† Museum Aud.	III Willard S. B. R.		IV Nat'l Museum Aud.		V Nat'l Museum
Public Health Administration		I Willard* S. B. R.		Sections adjourn at 11:25 A. M.	II Joint Session Willard S. B. R.			III Nat'l Mus. Aud.		IV Ebbitt Crystal Room	
Sociology					I		II Willard S. B. R.	III Joint Session Willard S. B. R.		IV Ebbitt White Parlor	
Industrial Hygiene		I Ebbitt White Parlor		II Ebbitt White Parlor	III Ebbitt White Parlor			IV		V Willard S. B. R.	
Vital Statistics		I Ebbitt Red Parlor		II Ebbitt Red Parlor				III Ebbitt Red Parlor		IV Ebbitt Red Parlor	
Laboratory					I Nat'l Museum Aud.		II Ebbitt Crystal Room			III Nat'l Museum Aud.	
Food and Drugs				I Ebbitt Crystal Room				II Nat'l Museum Aud.		III Nat'l Museum Com. Rm.	
Sanitary Engineering					I Ebbitt Red Parlor						
Board of Directors	I Onyx Room, Ebbitt	II Onyx Room, Ebbitt	III Onyx Room, Ebbitt								
Advisory Council				Election Willard S. B. R., 12:00 M.				Ebbitt Onyx Room 5:00 P. M.			
Entertainment‡											

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*Willard, S. B. R.—New Willard Hotel, Small Ball Room.
†National Museum Aud.—New National Museum Auditorium
‡For the ladies there will be an automobile ride through the parks, followed by a luncheon. The date will be announced in the final program.

THE WHITE HOUSE

The finest residence in the finest residential city in America. Site selected and cornerstone laid by George Washington. John Adams, in 1800, was the first occupant. Burnt by the British in 1814. When rebuilt, the Virginia freestone was painted white in order to obliterate the marks of the fire.

MOUNT VERNON

Alexandria, Va.

Reached by trolley, boat, or auto

Our "National Shrine," sixteen miles south of Washington, on the Potomac. Grounds and buildings, with all original design of furnishings, as when Martha Washington was mistress, have been restored. Property was purchased in 1860 by the Mount Vernon Ladies' Association, the present owners.

THE SCOTTISH RITE TEMPLE
Corner 16th and S Sts.
Open 9: 00 to 5: 00 to interested fraternal members

One of the many pretentious and modern lodge buildings of Washington, and the finest Masonic building in the world. Home of the Supreme Council of the thirty-third degree for the Southern Jurisdiction of the United States.

THE MUNICIPAL BUILDING
14th St. and Pennsylvania Ave.

Constructed of Vermont marble at a cost of some two million dollars. An excellent example of the modern tendency to produce public buildings of the greatest beauty. It contains the offices of the District Commissioners and all Municipal Departments except the courts. Washingtonians have no vote: three Commissioners are appointed by the President and confirmed by the Senate.

UNITED STATES TREASURY
15th St. and Pennsylvania Ave.
Guides available 10:30 to 12:00 and 12:30 to 3:00

Just east of the White House. Is the most substantial of Washington government buildings. Completed in 1867 at a cost of seven million dollars, but already only about half large enough to accommodate Treasury employees.

HYGIENIC LABORATORY, U. S. P. H. S.
25th and E Sts.

A perfectly-appointed laboratory, employing a staff of eighty. Divisions of Pathology, Bacteriology, Zoölogy, Pharmacology, Chemistry. Reference Library of fifteen thousand books and reprints. Art-room for U. S. P. H. S. Publications. Incubator, Cold, and Animal Observation Rooms. Routine includes Analysis of Specimens, Distribution of Cultures, Distribution of Pasteur Treatments and of Vaccines.

NEW NATIONAL MUSEUM
Smithsonian Grounds in the Mall
Open 9:00 to 4:30

Located on the grounds of the Smithsonian Institution. The buildings were erected at a cost exceeding three million dollars. It is the authorized depositary for all objects of scientific, artistic, and historic merit which come into the government's possession. The Collections include Exhibits representing the Customs and Industries of the American Indian, and a Natural History Exhibit of the Fauna of the United States.

VIEW IN CREEK PARK

American Journal of Public Health
Official Monthly Publication of the American Public Health Association
Vol. VII NOVEMBER, 1917 No. 11

ADDRESS OF PRESIDENT, AMERICAN PUBLIC HEALTH ASSOCIATION, OCTOBER 19, 1917.

W. A. EVANS, M. D.

SUBJECTS.

1—Summary of Annual Report.
2—Military Hygiene of Cantonments in Relation to their Environments: Consideration of Certain Diseases—
  a. Measles
  b. Mumps
  c. Pneumonia
  d. Meningitis
  e. Venereal Diseases
3—The Effect of the War on the Profession of Preventive Medicine and the American Public Health Association.

SUMMARIZED REPORT.

Ladies and Gentlemen of the American Public Health Association:

IN ADDRESSING the forty-fifth annual meeting of the American Public Health Association I wish, first, to thank you not only for bestowing the presidency upon me but also for supporting me in the discharge of the duties of the office.

During the year Canada has continued her part in the great world conflict and the United States and Cuba have taken position as her allies. These events with the internal troubles of Mexico, have served to add to the difficulties of our Association during the year.

When the United States entered the war we appointed a committee consisting of Doctors W. A. Evans, J. H. Landis, S. H. Gilliland, J. F. Anderson, J. D. Robertson, L. M. Powers, T. D. Tuttle, W. S. Leathers, and George Fuller which, with the secretary, sent out a questionnaire and placed the answers received at the service of the American government. I am informed that this material has been in constant use. This committee is still in existence ready to serve as called upon.

During the year your president and your first vice-president, representing your Association, were made members of the General Medical Board of the Medical Section of the Advisory Council of National Defense as well as members of some committees thereof. Your president was made chairman of the sub-committee on Health of Workers of the Labor Section of the Advisory Council of National Defense and he, through Dr. E. R. Hayhurst, appointed nine sub-committees from the membership of the Section on Industrial Hygiene. The about fifty members drafted from this section have prepared a series of valuable reports which I hope will shortly be published by the Department of Labor of the United States government.

In mid-summer your tried and appreciated secretary and editor was appointed a member of the Commission on Tuberculosis to France. He esteemed it his duty to go and thus "do his bit" and we reluctantly gave our consent. He was lucky in that he was able to turn his office over to Mr. A. W. Hedrich who had been serving as his assistant. Mr. Hedrich has brought to the discharge of his duties great energy as well as capacity.

We have suffered by reason of the deaths of many valued members, two of whom I feel that I must mention—Dr. H. W. Conn, a member of the Executive Committee, and Dr. Henry D. Holton, a former president and valued counsellor.

The outstanding event of the year was the grant to us of $25,000 by the Metropolitan Life Insurance Company for propaganda work in improving the quality of health service throughout the country. Just as it was given, the United States plunged into war and your Executive Committee has not deemed it wise to organize the machinery for this work. It is not their plan to undertake this activity until, first, the proper man to manage it is found and, second, until the country is functioning along more normal lines. In their judgment such effort during 1917 would not have given proper return for the money invested.

I call your attention to but one change in Association policy. Thinking that the welfare of the Association demanded more thought than our directors have been able to give them in previous meetings of the Association, your officers arranged for a clear day for business meetings of the Board of Directors on the first day of the meeting. I reported an account of my stewardship, so far as the business of the Association was concerned, to the first meeting of the Board of Directors.

I shared with you, I am sure, the anticipation of the pleasure of a 1917 meeting in New Orleans but, after advising with the Executive Committee, I assumed the responsibility of changing the meeting place to Washington. Conditions engendered by the entrance of the United States into war made this desirable.

The Executive Committee has given the time necessary for holding several meetings since last year.

As your president I have had the privilege of visiting many local groups of health officers.

I recently visited the Canadian Health Association carrying your good wishes. I especially mention them in order to call your attention to this fact—40 per cent. of these men in attendance, upon the authority of Dr. J. D. Fitzgerald, secretary, were in uniform. This was because they are operating a scheme under which provincial and municipal health officers and local health experts are taken into the service and then detailed to duty as sanitarians for military districts, in many instances coextensive with their civil jurisdictions.

MILITARY HYGIENE OF CANTONMENTS IN RELATION TO THEIR ENVIRONMENTS: CONSIDERATION OF CERTAIN DISEASES.

I wish to bring to your attention certain phases of military hygiene and, especially, the relation of civilians, health officials and authorities thereto.

The Report of the Surgeon-General of the United States Army for 1916 shows that the army had a death-rate of 4.45 of which, the death-rate from disease was 2.53.

The Report of the Surgeon-General of the United States Navy for 1916 shows that that service had a death-rate of 4.48.

These rates indicate that the health of the military forces compares more than favorably with that of men of the same age periods in civil life.

The reports which come to us from the armies in the field in Europe are exceedingly meager but, such as they are, they indicate very definitely that the death-rate from disease in this war, instead of being twelve times as high as that from wounds as in some wars or even four times as high as in most wars, will be less. Such reports as we are able to get from Germany and England indicate that the disease death-rate of soldiers and sailors will be lower than that in the Franco-German War or the Russo-Japanese War —the two wars in which the proportion of deaths from disease to deaths from wounds was notoriously low.

Among the accomplishments of this war are to be noted: the great reduction in tetanus due to wounds; the improved treatment of infected wounds; the improved treatment of burns; possibly the discovery of a specific for infections by gas bacilli; all in the field of surgery. The control of enteric diseases and, especially, typhoid, paratyphoid and cholera, and of typhus—all in the field of medicine.

Among problems remaining to be solved are those due to tuberculosis, trench fever, trench foot, trench jaundice, war nephritis, shell shock and gas poisoning. Possibly also, the European armies have been unexpectedly unable to cope with malaria.

The field of the sanitarian with the troops in the field is an interesting one, but I wish especially to direct your attention to the problems of keeping healthy the men in training in cantonments in various parts of the country. An editorial in the United States *Naval Medical Bulletin* for July, 1917, contains this statement: "Face to face with the enormous menace of the civilian population to our military service, when the former begins to flow in considerable bulk into the latter, we must prepare to meet the inevitable and contend against it as best we can." This I find to be in substance the opinions of both Army and Navy health officials. A study of the death-rates and such sickness rates as are available indicates that the fears of these gentlemen are well founded. May I ask for them an exhibition of patriotism on the part of civilian sanitarians in remedying the conditions complained of?

I wish especially to direct your attention to four diseases—measles, mumps, meningitis and pneumonia, and a group of diseases—the so-called venereal diseases. Each of these is a source of great disability and damage to military commands, especially in training and, so far as control is concerned, each is neglected by local and state health departments. So far as the men in training are concerned we can dismiss as of small consequence all of the diseases that can be vaccinated against. This includes smallpox, typhoid fever and paratyphoid, and tetanus. We can put aside, I am sure, all water-borne diseases and other diseases due to infection through the enteric tract. We can put aside typhus. Diphtheria is not of maximum importance, because of the large percentage of soldiers immune to the disease,—at times as high as 80 per cent., according to Nicoll.

Measles.—According to the report of the Surgeon-General of the Navy in 1915 measles was responsible for 7,472 sick days, ranking fifteenth among diseases. The 1916 Report of the Surgeon-General of the Army says: "Given the proper combination of season, crowding, bad barracks, etc., in a command of recruits, an epidemic of measles is more to be feared than smallpox. The chief factor in the spread has resulted almost always from overcrowding of susceptible and infected recruits."

All ordinary methods for the control of these epidemics have proved unavailing. Important as measles is to an army in the field the disease is a far greater menace to troops in training. In 1916 measles on the frontier was closely studied and reported on by Munson. The disease was everywhere controlled except in two commands. The officers, line and medical, of these commands were strongly condemned in this which I think is an epoch-marking report.

As the result of this experience Munson says: "Measles is a thoroughly preventable and controllable disease. Epidemic measles hereafter should be a reproach to the commander or medical officer concerned, a reflection of their efficiency and a cause for official investigation and discipline. . . . The writer," still quoting Munson, "desires to emphasize his absolute conviction that the long-accepted classification of measles as one of the eruptive fevers puts it in the wrong nosological category. It should be classed as an acute respiratory disease."

In the commands investigated by Munson 60.8 per cent. of the men had had measles, 16.2 per cent. had not had it, the remainder were unaccounted for for one reason or another. Of the 2,222 who were susceptible 444 had the disease. In a group of 1,739 susceptibles in commands where orders for the control of measles were carried out only 6 per cent. developed the disease. In the two commands the officers of which were condemned 264 men out of 482 susceptibles, or 54 per cent., had the disease. I submit that this rate among susceptible contacts is lower than in any previous experience.

Munson in the *Military Surgeon* for September, 1917, gives 28 procedures to be carried out, many of which could be administered unchanged by civil authorities and some could be administered when modified to fit civilian conditions. The method consists essentially in early diagnosis and strict isolation. In order to secure early diagnosis all colds, coryzas and minor disorders are made reportable when measles is threatening. The men are looked over by the surgeon daily.

To Munson's suggestions there is nothing to add except two points neither of which is covered in the 28 rules but both of which I am sure were made use of by the physicians immediately in charge as well as by Doctor Munson. First, an examination of the mouth for Koplik's spots will frequently reveal the presence of measles some days in advance of the onset of other symptoms. Chesley, in inspecting school children for measles, has the examiner place himself near a window and the children approach the light with their mouths opened wide. Koplik's spots are easily detected. The method is rapid. A few minutes serves for the examination of a room of students. The second point is this—company commanders might advantageously have a record of each soldier as to measles, mumps and German measles. Such a record would be of great service in controlling measles in camp.

Mumps.—I know of no health department that even claims to have a mumps policy. Control of the disease would cost more than such control would save. But when army camps are distributed throughout the country it becomes the duty of local health departments to attempt to control the disease because of the harm that it does to troops in training.

I wish to bring three points to the attention of military and civil health authorities.

A register of the mumps history of pupils in schools and of soldiers would be of value in the control of the disease. There is some authority for the view that the first local sign of mumps is redness in the mouth and pharnyx and that the parotid and other salivary glands do not become involved until such time as the infection has travelled up the secretory duct to the gland or glands.

The frequency with which parotitis is a complication of various infection lends support to this view. We might find that a systematic daily superficial examination of the mouths of suspects and the mildly ill similar to that advised for the detection of Koplik's spots would reveal the disease in its very earliest stage—before the onset of the outstanding symptom—enlargement of the parotid gland. With the onset of the fever there is at first a leucocytosis and then a lymphocytosis. Wollstein says that a lymphocyte increase of 7 to 10 per cent. precedes the enlargement of the parotid. Edwards quotes Wile as saying that a lymphocytis of 50 per cent. is pathognomonic.

Hess has been able to produce immunity against mumps by the intramuscular injection of 60 to 80 cc. of blood taken from persons with an acquired immunity to mumps.

It is not too much to hope that closer study of this neglected disease will develop that it can be habitually diagnosed prior to the onset of swelling.

The report of the Surgeon-General of the United States Navy shows that mumps in 1915 ranked fifth among diseases as the cause of sick days. The admission rate for mumps was 7.37; of measles, 5.52. The mumps admission rate in the United States Army for the same year was 9.80.

Pneumonia.—One of the major problems of health departments is, or should be, the pneumonia problem. The researches of Cole, Dochez and others by demonstrating that the types of pneumococci upon which pneumonia usually depends are not the types in the mouths of well persons, brings efforts to isolate and control persons capable of spreading pneumonia and to destroy their nose and mouth secretions, within the range of the possible. Bacteriologic diagnosis and serum therapy based thereon is in operation in at least one city—New York. The remainder of the country will watch their experiment with interest.

I wish to especially call your attention to a report made by Nicoll as the result of his experience with an epidemic of pneumonia at Fort Bliss, Texas, in 1916. This report, well worth your study, is to be found in the *Military Surgeon* for August, 1917. His conclusions were:

1. Epidemic pneumonia is to be expected in large camps in the winter months.
2. The disease is principally due to pneumococci of types I and II.
3. Serum treatment has produced excellent results in reducing mortality.
4. Direct evidence of tent, company and regimental contagion has been obtained.
5. Vaccination is considered a more promising measure of prevention than isolation.

I wish especially to draw your attention to the last recommendation. Nicoll says that vaccination should be done at the beginning of the pneumonia season. If thought advisable the vaccine used can be a combined pneumococcus and meningococcus vaccine.

Lister vaccinated men with 6,000 million dead pneumococci using three injections at seven-day intervals. He thought an immunity lasting eight months was produced.

The Surgeon-General of the Navy's report shows that in 1915 pneumonia was responsible for 9,156 sick days, ranking fourteenth. Gatewood says this disease is responsible for a damage rate of 1,467. In civil life pneumonia is responsible for one of the heaviest of all death-rates.

Cerebrospinal Meningitis.—One of the vivid recollections of my early childhood is of an epidemic of meningitis brought to the small community in which I lived by United States troops in barracks. In addition to the large number of deaths occasioned the community was left with a considerable number of one-eyed, blind and deaf persons among those who escaped with their lives. Furthermore, since that time meningitis has been mildly endemic in that community.

Meningitis is a disease of armies in the forming rather than of armies in the field. The opinion of the navy authorities is revealed in the following quotation from the United States *Naval Medical Bulletin* for July, 1917:

"When we consider how constantly the assemblage in barracks and camps of large numbers of young men of susceptible age is marked by an outbreak of cerebrospinal meningitis."

Rosenau says: "Cerebrospinal fever is a disease of soldiers living in barracks, garrisons, towns and camps rather than in the field. Crowding is the chief hygienic factor responsible for its spread."

Among the million or more men in training this winter there will be a considerable number of chronic meningococcus carriers. These are certain to infect their roommates. The number of men in a room will vary from 30 to 140. I am informed that the cubic feet of air space in these rooms varies from 250 to 400. The provision for heating and ventilation appears to me to be inadequate in those camps of which I have knowledge.

In view of these facts and the further fact that most of the training will be done in winter we must admire the wisdom of the authorities in deciding to locate the training camps in the South, in so far as was possible. The danger to the soldiers in training will be from colds and other infections through the nose in far greater measure than to infections through the enteric tract conveyed by water, food, milk and flies.

We can learn from the experiences with meningitis of the English, Canadian and Australian Army and Navy Corps. On February 24, 1917, Parkes (*British Medical Journal*) wrote that the method of controlling meningitis now used in the British Army has resulted in complete control of the disease. Rolleston on the 13th day of January, 1917 (*Lancet*), reported to the same effect for the British Navy.

On February 10, 1917, the *Lancet*, in an editorial, gave the methods for the control of cerebrospinal meningitis in the Army and Navy:

THE METHODS WHICH HAVE BROUGHT CEREBROSPINAL MENINGITIS COMPLETELY UNDER CONTROL.

These methods are as follows:

All recruits have a bacteriologic examination made of the nasopharynx before being allowed to mingle with the command. All those found to bear meningococci are isolated until their noses have been freed from this coccus.

Upon the development of a case of meningitis all contacts are isolated and bacteriologic examinations of the nasopharynx are made.

There are at least four strains of meningococci. Future action is somewhat modified according as the strain of meningococci found (when any are found) is the same as that in the case with which the soldier was in contact.

Diagnosis of meningitis is made by symptoms, by lumbar puncture, and microscopical, chemical and bacteriologic examination of the fluid, and by bacteriologic examination of the nasopharynx. Treatment is by lumbar puncture, injection of meningococcus serum, ventricular puncture in certain cases and by symptomatic treatment. Cases are isolated. The noses of cases, infected contacts and carriers are cleared up by local treatment. In cases where the nose is but mildly infected and the infection seems to be limited to the lower passages ordinary washing and douching of the nose with salt solution or permanganate solution is effective. This method is only effective in a limited number of cases. A more efficient method consists in the injection of chloramine oil.

The oil method as given by Flexner and Dunham and Dakin is as follows: The nose is cleaned with salt solution or 0.25 per cent. aqueous chloramin-T solution either by spraying or by irrigation. The nose is blown into a handkerchief between applications; and the chloramin-T solution is used thoroughly as a gargle.

2. When the increased flow of secretion from the nose has subsided the oil solution of dichloramin-T is applied with an oil atomizer. The oil spray is repeated at intervals so as to make at least four treatments daily about equally spaced from each other. The spraying should be thorough and the oil carried to all parts of the membrane accessible.

Gordon and Flack hold that most nose washes and sprays are ineffective and that the reason is that the cocci are in recesses unreached by such methods. In order to overcome this objection they devised a modification of the Falmouth atomizer. This throws a very fine mist of a watery solution of zinc chloride (1 per cent.) or preferably a solution of chloramin ($1\frac{1}{2}$ per cent.). A treatment room with a 750 cubic foot air capacity was built. The persons under treatment reclined on a cot in this room for 20 minutes, one treatment a day was given, one litre of the solution was sprayed in 15 to 20 minutes.

Most persons whose nasopharynges become infected clear up spontaneously in a few days or a few weeks. Some remain infected for months. Some become chronic carriers.

Gordon and Flack, after making proper allowance for the tendency of cases to spontaneously clear up, are of the opinion that the method devised by them is of distinct value.

One by-effect of the studies made of meningitis is much valuable information on the efficacy of nose washes and sprays in rendering the nasal mucous membrane sterile. I think it has been proven that systematic examination of the noses of recruits, so far from crippling the purely military work of a military establishment, forwards it. It shortens the periods of detention of the great majority of those affected, permitting the release of the majority within three days. In addition it protects against outbreaks. The effort more than pays for the expenditure.

Kenwood says: "Everyone will agree that circumstances leading to better air conditions at night and drier feet by day must greatly reduce the prevalence of invaliding. These catarrhal conditions unfit men for their training, lower resistance to several forms of disease and (as I believe) have been intimately associated with the high incidence of spotted fever among our troops. One cannot but be struck by the general coincidence of the prevalence of this cerebrospinal fever and a high sick rate from catarrhal affections; this may be due to a common predisposing cause but it is probable that catarrhal conditions predispose to spotted fever, possibly exalt its virulence and also favor its spread and that they are sometimes abortive cases of the disease. Furthermore, histories of outbreaks of spotted fever in civil communities show that they are usually associated with overcrowding and the attendant lack of cleanliness and ventilation and when spotted fever occurs we have learned the value of at once allowing more cubic space both to sufferers and contacts. And so it would appear that whenever catarrhal conditions are unduly prevalent amongst our soldiers it would be a wise precaution to let this fact serve as a signal for increased ventilation."

Permit me the following reflections concerning measures for the control of measles, mumps, pneumonia and meningitis:

The great problem of military medical authorities in the wars of the last quarter century has been to improve sanitation. Just as we are getting sanitation on a satisfactory plane the need for it is in great part removed by the general use of typhoid and paratyphoid vaccines. The Japanese rightly claim more credit for their low enteric rates in the Russo-Japanese War where they did not use vaccines than is due to the sanitarians of the present armies whose low rates are in greatest part due to vaccines.

It is plain that our troops in training will not suffer greatly from poor sanitation. Not only do the army surgeons know what is good sanitation but line officers not only know what it is but they want to have it enforced. More important still the men in the ranks, even the raw recruits, have learned the lesson.

The time has come to give to the methods for the prevention of diseases contracted through the nasopharynx as much attention as is given to those for the prevention of diseases contracted through the intestines. A part of such a method will consist in plans against measles, mumps, meningitis and pneumonia as already outlined.

I would suggest that to each command there be attached at least one comfort officer. It would be the duty of this man, or men, squad or detachment, to see that barracks were ventilated. Not only that there was provision for ventilation but that ventilation was carried out. To see that heating was right in practice as well as in planning. To see that there was no overcrowding night or day, in camp or out. To see that the men had enough blankets, that they slept warm, that they had enough clothes—warm enough but not too warm. To see that the colds rate was kept down—for in the wake of a high colds rate there is apt to come an epidemic of measles, mumps, meningitis or pneumonia. I think I would even go so far as to say, should it become necessary in order to provide a comfort detail, to lessen, in some measure the sanitary command, then lessen it.

Venereal Disease.—Venereal disease is responsible for a greater disability rate in both armies in the field and armies in training, than any other disease or group of diseases closely allied to each other. In the United States Navy they were responsible for 10,186 sick days in 1915, ranking first. The damage rate was 22.08. The army 'admission rate was 103.52, the next highest rate being tonsilitis—42.44. The reports by Osler and the *British Medical Journal* as to England, of Hecht and Moldavan as to Austria and of the *Deut. Med. Wochenschrift* as to Germany indicate that none of the combatants are succeeding in controlling venereal disease in the sense that typhoid or even tuberculosis is being controlled.

The prevention of these diseases in European armies since the war began is not altogether satisfying. Our own government, through its War Board, has taken the most advanced ground in the fight against these diseases that has ever been taken by any government. Our military surgeons and our philanthropic organizations are unusually active. Behind all of this is a powerful public sentiment. I think we can feel that the military are covering their part of the problem.

Of the Austrian troops infected with venereal disease the *British Medical Journal* says that 80 per cent. were infected in the interior and 20 per cent. at the front. With regard to the 80 per cent. the problem was one with which the local authorities had to deal. Moldavan gives the figures as 5 per cent. infected at the front, 20 per cent. on the lines of communications and 75 per cent. outside the sphere of the army.

This is the time for the initiation of venereal disease control directly and indirectly by municipal health and police departments. While such efforts should be especially urged upon communities within easy reach of camps it should not be limited to these. It is reasonably certain that sailors and soldiers have a much lower venereal disease rate than men at the same age periods in civil life. A military command cannot be kept free from contagion if contagion control is neglected in its environs. This is as true of syphilis and gonorrhœa as it is of scarlet fever and measles.

Not as an individual but as president of this Association I urge local health departments to class syphilis and gonorrhœa as contagious diseases and to undertake their control. I urge police departments to lend aid by repressing prostitution. Rosenau says: "The coöperation of the civil authorities in an effective zone about all camps, recruiting stations and other military places is essential."

I suggest that military commands establish a venereal disease norm for the troops in cantonments and barracks.

Gatewood gives the venereal sickness percentage rate of the navy as ranging from 0.5 to 0.7 per cent. Chamberlain gives it as 16 per cent. of a sickness rate of about 2 per cent. or approximately 0.2 per cent. Perhaps a rate of 0.5 per cent. would be right as a preliminary norm. It would be highly desirable to have a norm for the civil communities surrounding the camps but, obviously, this is impossible. The rate in the military establishment must serve as the gauge for estimating conditions both in the military establishment and in the surrounding country.

Whenever the amount of venereal disease surpasses this norm long leaves should be refused or sparingly allowed, venereal prophylaxis should be stressed, moral and educational prophylaxis should be redoubled.

To this I would add the advice that the preventive packet consisting of soap, some silver solution and some mercury ointment, be used whenever the soldier or sailor exposed is not to reach the prophylactic station within twelve hours. Reports by Holcomb, Riggs and Vedder indicate that about 7 per cent. of soldiers and sailors who expose themselves become infected with venereal disease. When prophylactic is used within an hour the percentage of infectives is 0.08. When used ten hours after exposure the rate is about 6.6 per cent. Nothing is gained by the use of prophylaxis after twelve hours. It is, therefore, advisable to have persons who are not to reach the prophylactic station until more than six hours after exposure to use the prophylactic packet. The report of the Surgeon-General of the Army says: "For the use of troops serving on the border and for detached service when the usual prophylactic cannot be given it is recommended that the prophylactic tubes formerly authorized be again issued."

But a program as limited as the above must prove disappointing. Whenever the rate rises above the norm the civil authorities and the philanthropic and social agencies in the civil communities surrounding the cantonment barracks should be called upon by the military forces and with some authority and insistence, if need be, discharge their duties. The city councils and health departments should provide for venereal disease dispensaries, laboratory diagnosis of venereal disease, free salvarsan or its substitute and other free treatment of venereal disease, repression of drug counter treatment, venereal disease quacks and venereal disease quack remedies and, in some instances, reporting of syphilis, gonorrhœa and chancroid. The program begotten of the war and now being installed in Great Britain is called to your attention.

The city councils and police departments should be called upon to repress prostitution. The newspapers should be called upon to censor their advertising columns and to help in their editorial columns. The philanthropic and social agencies should be stimulated in their activities.

To sum up: Patriotism as well as a proper regard for the obligations of officials and for the duties of life by other health authorities demand that the civil authorities make their communities safe for soldiers and sailors and civilians against measles, mumps, pneumonia, meningitis—and may I add, colds—and venereal disease.

EFFECT OF THE WAR ON THE PROFESSION OF PREVENTIVE MEDICINE AND THE AMERICAN PUBLIC HEALTH ASSOCIATION.

I do not think it requires much vision to see that out of this war will come a great increase in public health work. Preventive medicine is justifying itself and will continue to do so. Civil communities will not be slow to apply this to themselves. Thus will be created a greater demand for preventive medicine work and preventive medicine workers. A million, or perhaps several million, soldiers trained in personal hygiene and sanitation will be returned to the walks of private life. Inevitably, these men, banded together as they will be, as the Grand Army has been, will be the most powerful political force in the country. They will be sympathetic toward work in personal hygiene, in group hygiene and in sanitation.

There will be twenty thousand, and maybe forty or fifty thousand, physicians in the army and navy. A part of these will be practising curative medicine and surgery exclusively. A large number, let us say more than half, will go back into private life trained hygienists and sanitarians. These men will be available for positions as health officers. They will fill most of the places now filled by untrained men and, of course, thousands of other places. In addition to these, our engineers and bacteriologists and nurses will have had a vast experience and valuable training.

In the wake of the war some form of health insurance will come. Even though the prevention of disease should be more than incidental in the measure adopted the effect on preventive medicine will be great. Should the health insurance measures develop disease prevention as a prominent feature of the plan the effect on the profession of preventive medicine will be greater still.

To my mind, it is evident that the adoption of health insurance will do for the profession of preventive medicine what the adoption of workmen's compensation laws did for the Safety First movement and for the profession of industrial hygiene, and for the same reasons.

If, now, ladies and gentlemen, the above conclusions are correct then they logically form the basis for another conclusion. The opportunity of the American Public Health Association is at hand. If we carefully analyze the trend of events, if we carefully study the history of other organizations and if we plan on the basis of these analyses to properly serve the interests of the people, of public health and of our profession, their material welfare, their freedom from hazards and their opportunities, we should be able to build up an organization quite as strong in numbers and in influence as those which draw their membership from other professions or those which are supported by the practitioners of curative medicine.

BIBLIOGRAPHY.

GENERAL.

1. Chamberlain—J. A. M. A., Nov. 25, 1916.
2. Deut. Med. Woch.—Jan. 18 and Feb. 15, 1917.
3. Gatewood—Naval Hygiene, 1909.
4. Harvard—Military Hygiene (third edition).
5. Lelean—Sanitation in War (second edition).
6. Report Surgeon-General U. S. Army, 1916.
7. Report Surgeon-General U. S. Navy, 1916.
8. U. S. Naval Medical Bulletin, July, 1917.
9. Vedder—Sanitation for Medical Officers, 1917.

MEASLES.

1. Arken—Amer. Jour. Pub. Health, April, 1916.
2. Anderson and Goldberger—Jour. Amer. Med. Assoc., Aug. 5, 1911.
3. Anders—"Practice of Medicine."
4. Billings—Amer. Jour. Pub. Health, Dec., 1915.
5. Boudreau—Ohio Med. Jour., 1916, XII, 258.
6. Crum—Amer. Jour. Pub. Health, April, 1914.
7. Curtis—Amer. Jour. Pub. Health, March, 1916.
8. Curtis—Amer. Jour. Pub. Health, March, 1914.
9. Curtis—Amer. Jour. Pub. Health, Feb., 1914.
10. Chesley—Amer. Jour. Pub. Health, March, 1916.
11. Chesley—Amer. Jour. Pub. Health, Sept., 1917.
12. Flexner—Jour. Exp. Med., 1913.
13. Fraser—Ohio Med. Jour., 1916, XII.
14. Gray—Jour. Infec. Dis., 1915, XVII, 559.
15. Harrington and Richardson—"Practical Hygiene" (fifth edition).
16. Herrman—Amer. Jour. Obstet., 1916, LXXIV, 551.
17. Henderson—Amer. Jour. Pub. Health, Sept., 1916.
18. Hill—North Med. Rec., Aug. 12, 1916.
19. Hill—Amer. Jour. Pub. Health, Sept., 1910.
20. Herman and Koplik—Jour. Amer. Med. Assoc., July 2, 1916.
20a. Lane—Amer. Jour. Pub. Health, March, 1916.
21. Levy—Rep. Richmond, Va., Health Dept., 1910–12.
22. Munson—Military Surgeon, July to Sept., 1917.
23. Perkins—Cleveland Med. Jour., Nov., 1913.
24. Place—Boston M. & S. J., 1916, CLXXV, 704.
25. Riggs—U. S. Nav. Med. Bulletin, 1915, IX, 547.
26. Rosenau—Hygiene and Preventive Medicine (third edition).
27. Rucker—Pub. Health Rep., Sup. No. 1, Jan. 24, 1913.
28. Tunnicliff—Jour. Amer. Med. Assoc., April, 1917.
29. Veeder, and others—Jour. Amer. Med. Assoc., Dec. 9, 1916.
30. Whyte—Can. Pract. and Rev., 1916, XLI, 336.
31. Whyte—Medical Officer, 1916, XVI, 389.
32. Wilson—Archiv. Ped., 1916, 261.
33. Wilson—Med. Record, 1916, LXXXIX, 756.

MUMPS.

1. Edwards—Principles and Practice of Medicine (third edition).

2. Florand—Jour. Amer. Med. Assoc., April 21, 1917.
3. Hill—Amer. Jour. Pub. Health, Sept., 1913.
4. Henderson—Amer. Jour. Pub. Health, Sept., 1916.
5. Hess—Amer. Jour. Dis. Children, Aug., 1915.
6. Gordon—Reports to the Local Gov. Board on Pub. Health and Med. Subjects, 1914, No. 96.
7. Nicolle and Conseil—Comp. Rend. Acad. d Sc., 1913, CLVII, 340.
8. Rosenau—Hygiene and Preventive Medicine (third edition).
9. Wollstein—Jour. Exp. Med., March, 1916.

PNEUMONIA.

1. Avery—Jour. Exp. Med., 1915, XXII, 804.
2. Brill—Jour. Exp. Med., July, 1916.
3. Cole—Pub. Health Jour., March, 1916.
4. Cole and others—Jour. Amer. Med. Assoc., Jan. 13, 1917.
5. Dochez and Avery—Jour. Exp. Med., Feb., 1915.
6. Dochez, Vedder and others—Jour. Amer. Med. Assoc., July 8, 1916.
7. Dochez and Gillespie—Jour. Amer. Med. Assoc., 1913, LXI, 727.
8. Kolmer, Cohen and Heist—Jour. Infect. Dis., March, 1917.
9. Jour. Amer. Med. Assoc., May 12, 1917.
10. Jour. Amer. Med. Assoc., Dec. 23, 1916.
11. Lister—Pub. So. Afric. Inst. for Research, 1913.
12. Lister—Pub. So. Afric. Inst. for Research, 1913.
13. Nicolls—Military Surgeon, Aug., 1917.
14. Olmstead and others—Jour. Amer. Med. Assoc., May 19, 1917.
15. Rosenow and Falls—Jour. Amer. Med. Assoc., Dec. 23, 1916.
16. Riesman—Jour. Amer. Med. Assoc., Feb. 26, 1916.
17. Stillman—Jour. Exp. Med., p. 651, Dec. 1, 1916.

MENINGITIS.

1. Amoss and Wollstein—Jour. Exp. Med., 1916, XXIII, 403.
2. Anderson—Jour. Amer. Med. Assoc., 1917, LXXIII.
3. Armstrong—Med. Jour. Australia, Dec. 9, 1916.
4. Brown—Med. Jour. Australia, Dec. 9, 1916.
5. Collins—Rep. Med. Research Com. of Nat. Ins. Act, 1916.
6. Connell—Can. Med. Assoc. Jour., 1916, VI, 886.
7. Compton—Jour. Royal Army Med. Corps, 1915, p. 546.
8. Champtaloup—Med. Jour. Australia, 1916, p. 279.
9. Chalmers and Ferrall—Jour. Trop. Med., 1915-16, XIX, 101-117.
10. Douglas—Med. Jour. Australia, Nov. 4, 1917.
11. Dickinson—Brit. Med. Jour., April 7, 1917.
12. Denehy—Brit. Med. Jour., Nov. 18, 1916.
13. Drew—Jour. State Med., 1916, XXIV, 122.
14. Eastwood—Jour. Hygiene, Sept., 1916.
15. Edwards—Practice of Medicine (third edition).
16. Flexner—Jour. Amer. Med. Assoc., June 2, 1917.
17. Flexner and Amoss—Jour. Exp. Med., 1916, XXXII, 683.
18. Feldes—Lancet, March 3, 1917.
19. Fison—Jour. Royal San. Inst., 1915, XXXVI, 492.
20. Fitzgerald—Can. Med. Assoc. Jour., 1916, VI, 695.
21. Foster and Gaskell—"Cerebrospinal Fever," 1916.
22. Gordon and Flack—Brit. Med. Jour., Nov. 18, 1916.
23. Gamble—Lancet, 1916, II, 277.
24. Gordon—Jour. Royal Army Med. Corps, 1916, XXVII, 92.
25. Gordon—Brit. Med. Jour., 1916, 1849.
26. Griffith—Jour. Hyg., Sept., 1916.
27. Horder—"Cerebrospinal Fever," London, Oxford Press, 1915.
28. Halchoa—Brit. Med. Jour., Dec. 30, 1916.
29. Hort and Caulfield—Brit. Med. Jour., Oct. 14, 1916.
30. Hort—Jour. Royal Army Corps, 1916, XXVII.
31. Hort—Brit. Med. Jour., 1916, 1, 156.
32. Halahan—Lancet, Dec. 30, 1916.
33. Higgins—Public Health, 1916, XXIX, 193.
34. Jour. Amer. Med. Assoc., June 2, 1917. (Editorial.)
35. Kuster—Deut. Med. Woch., Sept., 9, 1915.
36. Kenwood—Lancet, Dec. 30, 1916.

37. Kennedy and Worster Drought—Brit. Med. Jour., Feb. 24, 1917.
38. Local Government Board (British), London, 1916.
39. Luridie—Brit. Med. Jour., May 15, 1916.
40. Lloyd—Brit. Med. Jour., Jan. 6, 1917.
41. Lancet—Editorial, Feb. 10, 1917.
42. Mazetti—Reforma Medica, May 29, 1915.
43. McIntosh and Bullock—Lancet, Nov. 27, 1915.
44. Med. Research Com. Rep.—Nat. Health Ins. Joint Com., 1915-1916, London, 1917.
45. Nowland—Med. Jour. Australia, 1916.
46. Nicholls—Can. Med. Assoc. Jour., 1916, VI, 969.
47. N. Y. Med. Jour., 1917, CV, 1039.
48. Nesbitt—New Press and Circular, 1916, CLII, 469.
49. Neal—Jour. Amer. Med. Assoc., 1916, LXVI, 862.
50. Osler, Rolleston and others—Practitioner, London, 1916, XCVI, 1, 18.
51. Parkes—Brit. Med. Jour., Feb. 24, 1917.
52. Rosenau—"Preventive Medicine and Hygiene" (third edition).
53. Rolleston—Jour. Roy. Nav. Med. Service, 1917, III, 1.
54. Rolleston—Brit. Med. Jour., Oct. 23 and Nov. 6, 1915.
55. Rolleston—Lancet, Jan. 13, 1917.
56. Rolleston—Jour. Royal Navy Med. Service, 1915, T, 375.
57. Robb—Brit. Med. Jour., April 14, 1917.
58. Rosenthal—Paris Medical, Aug. 12, 1916.
59. Southerland—Lancet, 1917, T, 351.
60. Southerland—Lancet, 1916, II, 729, also 826.
61. Scott—Jour. Hygiene, Sept., 1916.
62. Sheffield—Lancet, Feb. 10, 1917.
63. Sellers—Jour. Royal Army Corps, 1915, XXV, 676.
64. Stewart—Med. Jour. Australia, 1917, 333, 1916.
65. Scott—Journal Hygiene, 1916, XV, 464.
66. Von Ezdorf—U. S. Pub. Health Rep., May 9, 1913.
67. Worster, Drought—Brit. Med. Jour., Nov. 18, 1916.
68. Welsh and Brown—Jour. State Med., 1916, XXIV, 289.

Disinfection of the Nose.

1. Dunham and Dakin—Brit. Med. Jour., June 30, 1917.
2. Flexner—Jour. Amer. Med. Assoc., Sept. 1, 1917.
3. Kenwood—Lancet, Dec. 30, 1916.
4. Miller and Noble—Jour. Exp. Med., 1916, p. 223.

Venereal Disease.

1. Arthur—Medical Jour. Australia, Oct. 28, 1916.
2. Bloedern—Military Surgeon, 1916, 599.
3. British Medical Journal—1916, 11632.
4. Boston Med. & Surg. Jour.—1916, CLXXI, 577.
5. Balzar—Presse Medicale, 1915, XXIII, 401.
6. British Medical Journal, Nov. 4, 1916, p. 632.
6a. Bores—Social Hygiene, April, 1917.
7. Bolduan—Amer. Jour. Pub. Health, 1913, Vol. III, No. 10, 1087.
8. Baker—Amer. Jour. Pub. Health, 1915, p. 290.
8a. Brewer—Social Hygiene, April, 1917.
9. British Royal Commission on Venereal Diseases—Final Report, March, 1916.
10. Chargin—Amer. Jour. Pub. Health, 1915, p. 297.
11. Clark—Military Surgeon, 1916, p. 617.
12. Cress—U. S Med. Bulletin, Jan., 1917.
13. Cottle—U. S. Med. Bulletin, Jan., 1917.
14. Dyer—Interstate Med. Jour., 1916, XXIII, 649.
15. Davis—Amer. Jour. Pub. Health, 1916, VI, 346.
16. Donkin—Brit. Med. Jour., p. 1274, 1917.
17. Evans—Amer. Jour. Pub. Health, 1915.
18. Exner—Social Hygiene, April, 1917.
19. Gaucher—Bull. Acad. de Med., 1916, 35, LXXV, 678-761.
20. Goler—Amer. Jour. Pub. Health, 1916.
21. Goler—Social Hygiene, 1916.
21a. Hiden—U. S. Nav. Med. Bulletin, 1917, XI, 428.
22. Henrot—Bull. Acad. de Med., 1916, 730.
23. Holcomb—Military Surgeon, Jan., 1916, p. 30.
24. Jour. Amer. Med. Assoc.—1917, LXXIII, 375.
25. Jour. Amer. Med. Assoc.—1917, Sept. 2-9, 757.

26. Jour. Amer. Med. Assoc.—1917, Feb. 2, 10, 17, 24.
27. Jour. Amer. Med. Assoc.—1917, Dec. 9, 1916, p. 1771.
28. Jour. Amer. Med. Assoc.—Dec. 23, 1916, p. 1953.
29. Keyes—Social Hygiene, 1916, p. 1146.
30. Kirchner—Berlin Kiln. Wochen, March 19, 1917.
31. Lancet—1916, 11893–11562.
32. Lancet—1916, 1629.
33. Lancet—1916, 1869.
34. Lancet—1917, 1274–308.
35. Moldovan—Deut. Med. Woch., April 5, 1917.
36. Mudd—Military Surgeon, 1916, p. 608.
37. Neve—Brit. Med. Jour., 1917–T.
38. Owens—Military Surgeon, XXXIX, 265, 1916.
39. Platt—Amer. Jour. Pub. Health, Sept., 1916.
40. Osler—Brit. Med. Jour., May 26, 1917, p. 694.
41. Osborne—Amer. Jour. Pub. Health, June, 1916.
42. Platt—Amer. Jour. Pub. Health, Sept., 1916.
43. Porter—Public Health, 1916, XXIX, 156.
44. Power—Dublin Jour. Med. Sc., 1916, CXLI, 213.
44a. Ravenel—Social Hygiene, April, 1917.
45. Riggs—U. S. N. Medical Bulletin, Vol. XI, No. I, Jan., 1917.
45a. Riggs—Social Hygiene, July, 1917.
46. Report Surgeon-General, U. S. Army, 1916.
47. Report Surgeon-General, U. S. Navy, 1916.
47a. Rueker—Social Hygiene, April, 1917.
48. Robertson—Public Health, 1916–17, XXX.
49. Rosenau—Hygiene and Preventive Medicine (third edition).
50. Snow—Amer. Jour. Pub. Health, June, 1916.
51. Snow—Jour. Amer. Med. Assoc., 1916, LXVI, 1003.
51a. Snow—Social Hygiene, July, 1917.
52. Snow and others—Jour. Soc. San. and Mor. Prophylaxis, 1916, VI, 70.
53. Stillians—N. Y. Med. Jour., July 17, 1915.
54. Simon—Jour. Amer. Med. Assoc., April 28, 1917.
54a. Social Hygiene—Editorial, April, 1917.
55. Tullidge—Military Surgeon, 1916, Vol. 39, p. 49.
56. Vedder—Bulletin No. 8, Office Surgeon-General, June, 1915.
57. Vedder—Military Surgeon, 1916, XXXVIII, 340.
58. Warner—Cleveland Med. Jour., 1916, p. 171.
58a. Weber—Social Hygiene, July, 1917.
59. Pusey—"Syphilis as a Modern Problem," 1915.
60. Public Health Reports—1916, XXXI, 2063.

FOOD CONSERVATION AND THE WAR.

HERBERT C. HOOVER,

Director, United States Food Administration.

Address before the American Public Health Association, October 19, 1917, at Washington, D. C.

I AM glad to have this opportunity, not to deliver you an address but for a discussion, and in order that you may have some grasp of what our problem is, I wish to outline to you something of the food necessities of the world at the present moment.

As you are aware, we are suffering from an enormous shortage in shipping. The consequence of that is to drive the shipping of the world on to the shortest routes and to force our allies to procure their foodstuffs from the nearest market. Practically the more remote food markets of the world are at the present time isolated. Our allies, in pre-war times, were largely dependent upon imports for their food supply. They imported a matter of three quarters of a billion of bushels of grain annually; and now, due to the diversion of men to war and of women to the workshops, their own productive capacity in foodstuffs has very materially diminished. That diminution pictures itself this year in a shortage in their combined harvests of upward of five hundred million bushels of grain; therefore, if we are to maintain even a reduced consumption in grain of the allied countries, there is thrust upon us the duty of supplying the major part of a billion bushels of grain. You can perhaps appreciate what a gigantic load that is if you bear in mind that our average pre-war exports from the United States were only one hundred and twenty-five million bushels. Much the same situation exists as to other foodstuffs.

We will have to accomplish that particular problem from many directions, in the first place, a stimulation of production in the United States and Canada. That has been attained with the exception of one cereal during the past year. Our wheat harvest is below normal; our other cereal harvests are above normal. Beyond that, the allies must reduce their food consumption to a very extraordinary degree. Those measures have been taken all over the allied countries. They are receiving an average food intake at the present moment of which the American public have no appreciation whatever. We can contribute greatly to this whole problem if we can reduce the consumption of foodstuffs in this country. The problem of reducing consumption has a fortunate phase for us. The limited shipping requires the shipment of the most concentrated forms of food; we must ship cereals, we must ship meat, pork products and dairy products; practically nothing else can be afforded. We have this year an abundant harvest, an abundant crop of all the vegetables; we are, therefore, in position to substitute vegetables for the other commodities that we must transport abroad. Further than that, we have a corn crop, this year, without parallel in our history, and we can, to a considerable degree, moderate their position if we can substitute corn for wheat. A certain basic amount of wheat is necessary for all populations. I will not go into the dietetics of the matter; the problem is largely not dietetic but psychologic and a matter of equipment. I may state generally that France and England have always lived on baker's bread, that there is practically no home baking of consequence on the continent; that there is no equipment for home baking. The manufacture of corn bread and the distribution of corn bread is an impossibility from bakeries; such bread is not a bread of sufficient endurance. Further than that, they have never eaten corn and, therefore, have no milling capacity for corn meal; and corn meal, itself, transported abroad, is not sufficiently durable to stand the period of distribution without deterioration. Therefore, we must supply our allies with a certain basic amount of wheat. They are asking us to supply 60 per cent. of their bread requirements. They are mixing corn, peanut meal, soy-bean meal, cotton-seed meal, barley, rye and potatoes for the other 40 per cent. Their bread is a war bread and a bread of tears and privation. We can be of the most material assistance if we can substitute cereals to which we are accustomed for wheat to send to them, sufficient for the basis of their loaf.

Beyond the problem of cereals, we have a problem of meats and fats. In the matter of meat, we can substitute fish, for we have an abundance of fish; we have only to take it from the sea, and we have made every arrangement to increase our production.

All can substitute poultry, etc., to some degree. In the matter of fats, we can offer no substitution but we can offer some advice. We have recently completed a very accurate series of computations on the fat consumption of the American people; taking the basic position of the number of hogs and cattle that go to market, taking the production of our vegetable oils that go into edible products, and our dairy produce, and we find the astonishing fact that the consumption of the American people in fats is over 150 grams per person per diem. In Belgium we have fed for three years a population of 10,000,000 people and maintained public health on a ration of 40 grams. The present German ration is but little over 30 grams; therefore we are the greatest wasters of fat under the sun, and it is no hardship and it is no nutritional danger to the American people that we should reduce our fat consumption, and it is only by virtue of a direct reduction that we can hope to supply the demands for fat necessary to maintain the public health in the allied countries during the coming winter. Prior to the war we exported a matter of about five hundred million pounds of fat products per annum. During the last year we exported a billion and a half. During this year we wish to raise those exports to over two billion. If we could secure a reduction in our American consumption by 5 per cent., we would be able to accomplish that problem.

There is a phase of all conservation, and that is the phase of *waste.* Amongst 30 per cent. of our households there is an enormous waste. In 70 per cent. of our households, especially at these high prices, there is a sufficiency of thrift to guarantee but little loss or waste of foodstuffs, but in the remaining 30 per cent. there is a waste which, if it alone could be curtailed, would accomplish two thirds of the problem we have to solve.

All these problems have a health value. I understand from our medical advisers that there has been a steady increase in nutritional diseases in this country for the last thirty years. The efforts made by your body and the people associated with you in public health work have produced marvelous results in infectious diseases, but the constantly increasing consumption of foodstuffs in the United States is probably responsible more than any one other factor for the increase in nutritional diseases. Therefore, if we could get a reduction in consumption we are attacking a public health problem as well as a war and economic problem. We have carried on in Belgium during the last three years the most gigantic laboratory in nutritional matters that the world has yet seen. We have found that we can maintain the public health on a matter of 60 grams of protein, of 40 grams of fats and 300 grams of carbohydrates. A large portion of the time we did not attain that ration, and that ration represents very much less than the food intake of the American people. We found that we had improved the public health; we found a decrease in all nutritional diseases during the progress of the relief. We found by the special care given to the children and the special adjustment of their diet, that we improved the health of all the children under four years of age. The infant mortality in Belgium has never been so low as it was when the Americans were compelled to retire last February. We found, as an incident to that work, some things that had not been recognized by nutritional experts hitherto. One of them was that adolescent children require a larger proportion of fats than adults. We had all of the population over six years of age practically on a uniform ration of fats. We found a gradually increasing amount of tubercular diseases in the adolescent children, and after some study we concluded that it was probably the shortage in fats and we at least determined to attempt a remedy in that direction. We assembled all of the children of adolescent years in schools for a meal, once a day, comprised of a majority of fats as an extra ration, and we got an immediate response in the tuberculosis percentage of the country. To sum it up, the lesson that we obtained out of the entire experience is that over-feeding is one of the greatest dangers to public health; and therefore, if, in the course of our work, a work undertaken with war objectives, we can secure a reduction in the scale of living in the United States, a reduction in the amount of food intake, we believe that we will have accomplished a great deal toward public health as well.

Now in that matter you can be of the most material assistance to the

Food Administration, if to this work, which is primarily a work of war and self defense, you can give the added value of a public health work; if you can preach it morning, noon and night as a sound doctrine for the advantage of each individual in the country, you will have placed behind us a background that we cannot otherwise obtain.

The problem of the conservation of foodstuffs has other values, the principal of which is the matter of saving. Wars are not paid for out of the capital of a people; we must pay for them out of our savings. The first issue, and perhaps the second, to a considerable degree, of liberty loans, may be met out of our accumulated savings, but if we are to go on with the war, if we are to find these increasing taxes and if we are to find further subscriptions for liberty loans they can only be found from an economic point of view, in the savings of a people. The volume of saving amongst the American people today is not large enough to carry this financial burden, and we must secure, in many directions, a reduction in expenditure amongst our people. We must not only secure a reduction in the consumption of foodstuffs, but we must secure a diversion of labor from non-productive work to productive work. Those are perhaps side issues but they bear on the conduct of every household in the country. Our food budget is our largest and, therefore, should be our first point of attack. If we can reduce the food consumption or the food waste, alternatively, in the American public, by six cents per capita, per diem, we will have saved two billion dollars per annum, or 10 per cent. of the cost of the war. There are other values still. There are the moral values of temperate living, so that we feel *en masse* that if we can secure a proper conservation of the food supplies of this country, we will have made it possible to feed our allies—a vital issue to winning the war—we will have improved the public health of our people, we will have increased our savings and our financial ability to carry on the war, and we will have improved the moral stimulus of the people as a whole.

We have no powers in law to effect conservation except such conservation measures as we can compass through trade handling. We have no right, nor have we ever wished for any right to influence the American household other than by its voluntary effort. Conservation measures abroad are being accomplished by the force of law and by the force of the police. The waste of bread in England, France, Germany and Italy today is punishable by fines, as much as $250 for every offense. We wish for no such system in this country. It is our belief that that foundation of democracy is individual initiative, and if the faith is worth defense, democracy can and will rise to defend itself. Also it must do this and still preserve the individual initiative of the people, and we can only secure and maintain that initiative if we can create these agencies and effect these results by the voluntary effort of every man, woman and child in the United States. The problem of conservation is a problem of twenty million kitchens, twenty million tables; it is the act of every individual three times a day. There is no real conservation without reduction in consumption and the elimination of personal waste. For if we eliminate all the waste of trade, and we are rapidly eliminating them all, even then we can save probably less than 2 per cent. of our foodstuffs.

If we could reduce 10 per cent. of our consumption it would be to the advantage of our people; we will have effected all of the ends that we must attain. The problem with us is whether or not we can secure that as a voluntary response in the American people. There is in this question wholly a problem of education. It is our belief that every loyal American wishes to serve the national cause and the national defense and that if it can be brought home to him that his spoonful of sugar and his slice of bread saved is an accomplishment of the national end, we believe that we can attain that, but that it can only be secured if we can secure that every individual in the country is impressed with the fact that it is his or her individual duty. There is a position in which you can be of the most inestimable service to us, if you can carry that message to every household and every person within your acquaintance and throughout the whole of the health associations of the country: that it is a national service, and that it is vital for the continuation of the war, that we cannot maintain our allies constantly in this struggle unless they are to receive this sixty million bushels of grain every month, and that we cannot attain it unless we can reduce the consumption and waste at every kitchen and every table in the United States. We believe that this can be done, but it takes a long time for people to realize its seriousness. It first strikes many people as a curiosity and a matter of general interest, but one in which they are prepared for somebody else to acquiesce. It is with the utmost difficulty that every individual can be impressed with his own responsibility. We have had a great number of exhibits. We have been pleading with the American people to reduce the consumption of sugar for four months, and every month we get the statistics of the sugar distribution of the country and we have found no diminution whatever. The net result of that is that we are practically out of sugar today in several states. I do not look on that as a matter entirely without compensation; it will at least bring a realization to the people of the United States that there is a limited amount of food supply in the world and that, unless they are prepared to join in saving that food supply, they themselves will suffer the direct result of it.

It is absolutely vital to us to continue this export of foodstuffs to our allies. They hold our first line of battle, and if the western line in France breaks down, that line will move to the Atlantic seaboard within thirty days. Therefore we intend to maintain that food supply crossing the seas.

We are told by many economists that the proper conservation of food supplies will be brought about by high prices. I have had myself three years' experience in that matter, and all actual and practical experience works in the opposite direction. We have no better proof of it than the fact that the consumption of fat in this country has increased about 10 per cent. since the outbreak of the war, and we have had a universal era of high prices. It is, therefore, obvious that the high price itself will not accomplish a reduction in consumption. High prices have a great disadvantage in the fact that they distribute the burden of war unequally on a population, in that the poor, the people with the fixed incomes, suffer for those who reap the values of war commerce.

We cannot allow a continuous rise in price in the country without a continued readjustment of wages, so that we are between two evils; either we must readjust the wage and the earnings and salary of the entire population with the advance in price, or we must check this price raise in order to maintain some economic stability. Therefore, we are interested in conservation from a price point of view, in that if we can secure a reduction in the consumption of foodstuffs in this country over and above our allied needs, we need give no concern to price. If, on the other hand, we are to have a deficiency in foodstuffs, we must take the most vigorous measures, and as such measures will not always be successful in the restraint of price, you can see that conservation becomes to us an economic problem of no mean order.

There is one more phase of this whole problem that I want to put before you, and I will end. (1) We have been forced to this war; (2) war in defense is a necessity; (3) war is a losing business, a financial loss, a material loss, a loss of life and an economic degeneration throughout its entire period. It has but few compensations and of them we must make the most. Its greatest compensation lies in the possibility that we may instil into our people unselfishness, self sacrifice, devotion to national interests. We have gone for a hundred years of unbridled private initiative in this country and it has bred its own evils and one of these evils is the lack of responsibility in the American individual to the people as a whole, the unwillingness of personal selfishness to sacrifice to national interest. We are calling upon many of our people to make the ultimate sacrifice, and it is but little to call on those who remain in comparative comfort that they should make some saving in their kitchens and on their tables. If we can secure that service, we will have instilled in the heart of every man, woman and child in this country the fact that he is doing a national duty and that service carried through the war, the daily feeling that some sacrifice is being made for the nation as a whole, is a compensation in itself.

THE NAVY AND ITS HEALTH PROBLEMS.

Surgeon-General William C. Braisted, U. S. N.,
Washington, D. C.

Read before the General Sessions, American Public Health Association, Washington, D. C., October 18, 1917.

THE history of hygiene is one that is replete in military and in civil lines with names of eminent achievement. I wonder if we all fully appreciate, or does familiarity blind us to the fact that we have in our midst and have just been listening to, one whose name will go down in the pages of history as equal, in his benefit to the human race, to the greatest of those who have preceded him. The man who made the Panama Canal possible will never be forgotten by future history.

Gentlemen: Hygiene is of all ages and hygiene is in itself civilization. That which constitutes the gradual and imperceptible advance from a barbaric state to that of our present luxury and safety in our civil life is but hygiene. It has always been a matter of romantic interest to me to watch the gradual development of naval hygiene, impelled by the spurs that have made all progress in hygiene possible, the crowded conditions that have presented themselves in ship life as in civil life. Whether recognized as such or not, naval hygiene has necessarily been a concomitant of the life of all mariners since the first frail barque ventured upon the Mediterranean or skirted the shores of the mysterious and unknown Atlantic. Inconveniences and hardships have been and always will be experienced where men endeavor to live, to work or to fight in the unnatural surroundings of ship life. In the earliest days unconscious efforts in hygiene were directed toward the retention of life, in order to make maritime traffic and warfare possible in these surroundings. Efforts at amelioration of overcrowding aimed no higher.

As far back as the history of the world has been chronicled, the seas have been navigated and nations have bartered and have fought. The Hebrews, Phœnicians, Greeks, Carthaginians, Romans, and Britons have all shared in the development and the mastery of the sea, and by the increasing boldness of their cruising created the major hygienic problems that have confronted us ever since.

The stanchness of construction found necessary to combat the wildness and buffets of the larger seas, the greater storage space for distant cruises, made necessary an increasing number of decks to house personnel and stores. The comparative slowness of naval architecture may be typified by the fact that the *Great Harry*, built in 1545, the pride of the English Navy of that day, was 138 feet long, 36 feet wide, and carried 80 guns; and in vessels materially smaller than this Columbus discovered new continents, DaGama rounded the Cape of Good Hope, and Magellan's ships circumnavigated the globe. Developments in number, size and armament were rapid thereafter, spurred largely by the spirit of exploration and conquest created by the discovery of new worlds and by the increasing rivalry for the mastery of the seas by the English, Dutch, French and Spanish. The study and application of hygienic principles became a steady problem with the development of larger fleets. In the last 500 years the study of naval hygiene may be considered as the study of hygiene of the British Fleet.

It has not been until the last 100 years that distant fleet cruising has been feasible without terrible loss of life. Epidemic fevers, hunger, and scurvy have demanded toll by thousands. The problems that were met in that day are problems that are met today; improper ventilation, unsatisfactory humidity, poor light, and deficient or defective food and water, all in connection with constant and unavoidable overcrowding. I might almost say that only one problem that has arisen in the hygiene of cruising ships in past history has been satisfactorily solved, that is, the once terrible menace of scurvy. We owe it to James Lind's discoveries and to Sir Gilbert Blane's vigorous enactment thereof that this scourge has been eradicated as a fleet menace. In his Treatise on the Scurvy, Lind said: "In the late war scurvy cut off more valuable lives in our fleet than the united efforts of the French and Spanish arms." Commodore Anson in his famous voyage round the world in the first nine months lost 666 men out of 961.

It was not, however, until the year 1797 that the systematic use of lime-juice was introduced into the British Navy through the importunate solicitation of Sir Gilbert Blane. This fortunate circumstance was brought about in consequence of the alarm created by the prevalence of scurvy in the fleet under the command of Lord Howe in the spring of 1795, the outbreak being traceable to causes highly analagous to those which induced the epidemic on former occasions, namely, the deprivation of fresh vegetables. So prevalent was scurvy in this fleet and so much enfeebled were the crews by its visitation, that the ships were rendered quite inefficient and the safety of the empire became in consequence absolutely imperilled.

The remarkable success, from a hygienic point of view, achieved by Captain Cook in his three year voyage around the world in which with a crew of 118 men he lost only four men, two from drowning, one from a fall, and only one from disease, are attributable to his observance of hygienic common sense and the observation and deductions of James Lind. His measures consisted in providing a dry and well ventilated ship, storing it with good provisions, a supply of lemon juice, and an abundant supply of fresh water, fresh vegetables and fruit at every port when procurable. Great pains were taken to see that the men kept themselves clean, and that the hammocks, bedding and clothes were kept clean and dry.

With scurvy eliminated the chief problem that the mariner of old had to contend with, which is not encountered at the present time, at least in naval cruising, is that of the moisture and over-humidity encountered in wooden ships, particularly those of many decks. The chief concern of naval hygienists of the last century, and only materially obviated by the use of steel and iron, was that of the constant moisture and over-humidity below decks due to the necessity of cleanliness and the difficulty in reducing the heavy moisture incident thereto. Many conditions which we know from our present knowledge to have been due to extraneous causes, such as the epidemic influences producing yellow fever and typhus, were attributed to the baneful influences of the humidity below decks. Ventilation, other than natural, was procured in those days only by means of windsails; light came from a tallow candle or oil lantern; food for longer voyages was necessarily dried or salted; and water was carried in hogsheads or tanks that were refilled at the various ports of call, even though its source might be doubtful.

In contrast to these conditions, gentlemen, let me outline what may be unfamiliar to many of you, our modern methods of ventilation aboard ship. Artificial ventilation may consist either in supplying a large abundance of fresh air, diluting or driving out the impurities in the living spaces, what we call the supply system, or secondly the method whereby we exhaust from the living spaces the vitiated air. This latter method is rarely used alone but it is used as supplemental to the supply or plenum system.

In the supply system large intakes are situated at such points as will insure the greatest purity of supply with least possibility of contamination. The air is driven by large fans throughout the ship, in branching and diminishing channels similar to the arteries and capillaries of the human circulatory system. The needed supply for the various living spaces varies with the complement living or working therein, and mathematical accuracy is possible in estimating and delivering to the various living spaces the amount of air necessary for the hygienic well-being of their personnel. Living spaces that never see sun or daylight and that are never reached by the natural channels of ventilation are rendered perfectly and hygienically habitable by such methods. There are many such individual systems throughout the ship and compartments vary widely in their demands as regards the character and quantity of air supply. An effort is made as far as possible to include in the ramifications of one trunk line spaces of similar demand. Heat is supplied through the same channels by installing large heating systems called thermo-tanks in these various trunks. A much more beneficial and economical distribution of heat is possible by this method than by that of a number of scattered radiators with their necessarily greater ramification of steam lines.

With a carefully controlled supervision of these various heating units, and by an effort in their installation to secure a uniformity as regards their demand for heat, a remarkably successful combination of ventilation and heating has been achieved. In contrast to the old problem of excessive humidity and its deleterious effects we have now in consequence of this arrangement very frequently an overdrying of the air, particularly objectionable in its effects upon the mucous membranes of the nose and throat. Various efforts are now being made to overcome these objections, none as yet entirely successful. The method of washing and consequently purifying as well as humidifying the incoming air as practised in our larger hospitals and institutions, is impracticable in ship life for various reasons.

The lighting of the modern battleship presents many more problems than does the similar achievement in the schoolroom or in the factory. That character of lighting most suited to the individual space, either the direct, the indirect or the semi-indirect is utilized, and the character, size and position of the various lighting units are carefully studied. Luckily the powerful heating plant necessary to the maintenance of such a tremendous structure as our modern battleships, provides an abundance of energy for the maintenance of the very extensive lighting system necessary for a structure 1,000 feet long, 7 to 9 decks deep, and housing a personnel of 1,000 to 1,500 men.

The seagoing battleship formerly so subject to scurvy and to hunger owing to deficiency in character or in quantity of the food supply carried, is today no more dependent on outside conditions, or upon the distance of its cruising or the ports visited, for a wide and varied food supply than is the most modern hotel. Large cold-storage plants are maintained where meats, vegetables, and fruits are safely stored and which manufacture daily large quantities of ice. Modern methods of preserving and canning have also been of tremendous benefit.

No longer is the cruising ship dependent upon an uncertain water supply, as all fresh water consumed is distilled from the salt ocean upon which the vessel floats.

Infectious diseases that formerly carried off their thousands, such as yellow fever, typhus, cholera, and typhoid have all yielded to our modern knowledge of their causes and our consequent logical measures taken for their prevention.

How successful the naval hygienists have been in saving life may be indicated by the fact that prior to the introduction of antiscorbutic measures in the British Navy, the death-rate was approximately 120 out of every 1,000, per year. Fifty years later the death-rate in the British Navy was 30 per 1,000 of personnel. Last year in our own service this loss was but 4.48 per 1,000 of personnel. Not only are these figures gratifying by comparison with previous years; but they are doubly gratifying to me in that an analysis of them reveals the fact that a marked factor of safety is apparent in naval life over the figures of the same character of personnel in civil communities. The total death-rate for the registration area of the United States for the census year 1910 was 17.8 per 1,000 of our population. This of course includes all from infancy to old age; but even for the ages from 20 to 29 years which would approximate fairly closely the average naval age limit the mortality tables give 8 per 1,000 as the incidence of death. This includes both sexes and would be appreciably higher if quoted for males alone.

Thus we have roughly a death-rate of 8 plus per 1,000 and 4.48 per 1,000 as the respective rates for the young men of our country, the larger representing the risk incurred in the ordinary hazards of farm or city life, the latter representing the peace time losses while serving their country, and while under the constant watchful care of the Medical Department of the Service.

But please do not let me seem to convey to you what would be a contradiction of what I have already told you. We have not perfectly ventilated ships, we have not perfectly lighted ships, and we have not perfectly provisioned ships! There is marked room for improvement in all these lines and it is our constant effort and thought to reach higher ideals and efficiency. And complicate all these structural and supply problems with those of the individualities of the 1,000 inhabitants of our berthing and messing spaces, and you will have some idea of the complexity of questions possible.

You know what diseases, what habits, what crotchets of the brain, may be existent in such a gathering, and what measures are necessary to eliminate, correct and counteract these, and to establish a normal living community standard.

The requirements of training make for an ever shifting personnel at sea and again as men complete their period of service — 4, 8, 12 years or more— others come to replace them, recruits fresh from civil life and its varied pursuits. Thus we have a constant flow of influences, that may be good or bad, direct from the communities of many types scattered throughout our broad land. Here is a youth from a town where the inhabitants do not believe in vaccination or where the authorities have not yet risen to the height of enlightenment which dictates chlorination of the lake water they drink though their supply pipes are not 100 feet from the sewer outlet. He is a potential menace to his shipmates unless the government's compulsory protection has been furnished him by the surgeon. Yonder robust youth hails from a rural section where air and sunshine abound but he left at home a younger brother just recovered from cerebro-spinal meningitis. He himself is a "carrier." Beside him with bright eye and ruddy cheek, but drawing swift breaths under the weight of his bag and hammock is a lad that must soon occasion serious thought to the guardian of the ship's health. Leave is requested to go home to see his mother reported dying of "something wrong in her chest." What is to be our attitude to tuberculosis, for instance, and is a hard and fast standard possible by which we may protect our crews from the presence of latent cases? By what criterion are we to recognize the incipient case and secure for him and in the interest of his shipmates the prompt transfer to sanitarium so essential for the good of all concerned?

How shall we clothe these young

men, how many calories must their daily food consumption yield for work and play? How may we adapt the big muscled coal passer, the intelligent looking firemen to the trying conditions in the bunkers and fire rooms down in the bowels of the ship and how shall we protect, increase and prolong their useful activities under conditions so unfavorable to growth and life? The anchor has fouled its chain and behold two divers are preparing to submerge and disentangle it. Skimming along the surface a cable's length from us goes a submarine preliminary to a dive. What of the air and food of the denizens of that bold craft, crowded into a minute space under the menace of chlorine gas arseniuretted hydrogen and carbon dioxide ever threatening.

High above us we hear the soft purring of the seaplane motor. Into a realm new to man are venturing bold and fearless aerial navigators. What of their physical requirements, what of the development of senses heretofore of limited use, what of the effects of atmospheric tenuity on the human organization!

We are living in a great age, throbbing with new and mighty endeavor. A century ago could we have convinced a visitor to this city that cars would run over a route propelled by unseen force of electricity, guided by a wire? Would we have believed it possible that you and I could talk to a friend in Chicago or to the captain on the deck of a war ship at sea? Would he be astounded with the thought that Jules Verne's dream of submarine navigation had come true? Would he be amazed in realizing that today air ships are gliding aloft, going hither and thither in the aerial ocean, offering all in one, the possibilities of travel over land and over water.

Gentlemen, past history and even more so present history have revealed the meaning of the navy in Great Britain's national life. The watery isolation of that wonderful island empire from its past, present or future antagonists of the old world is entirely analagous, only on what is and will be a stupendously more magnificent scale, to the situation of our own country and continent. What the future must inevitably hold, if armaments continue, for this great colossus of a nation, is that of the dominating naval power of the world. No spirit of aggression will prompt it but a spirit of defense will demand it.

And in the conservation of the health and wellbeing of its personnel, without which its crowded battleship would be but as Goliath before David, I pledge myself, my present colleagues of the Medical Corps of the Navy, and those who will shoulder our burdens when we are gone, in life and in death, to the preservation and the perpetuation of the glory of our country and our flag.

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THE RECENT MEETING OF THE ASSOCIATION AT WASHINGTON.

The forty-fifth annual meeting of the American Public Health Association was the most successful meeting in its history. So great was the response from all sections of the country that attendance estimates were exceeded, and at a number of the general sessions the halls were crowded, so that many were compelled to stand.

The members were in Washington for work and they stuck to their tasks. The local committee had been requested to provide no entertainment but this request was disregarded to the extent that there was a general reception in the New National Museum at which the Marine Band rendered music. The time of the visiting ladies was occupied by teas, receptions and automobile rides.

The central theme of the meeting was the health of the first line of defense—the military forces. Surgeon-General Gorgas, Admiral Braisted and other speakers told of the plans for maintaining the health and efficiency of the troops in training and in the field. Drs. Trask and Frost told of the plans of the Public Health Service and the American Red Cross to protect the military by making their surroundings healthful. Drs. Goodwin, Rist and McCullough gave the experiences of the English, French and Canadian armies. President W. A. Evans presented a review of the present status of communicable diseases, with especial reference to war problems. A multitude of speakers presented the problems of the civil health officer, especially those in direct, and somewhat indirect relation to the health of the military.

Surely the problems of military hygiene in relation to the environments of military establishments are less difficult by reason of the deliberations of this meeting. We should begin to head toward another great meeting at which attention should be focussed on the health of those who constitute the second line of defense—the general population.

It was proper that this meeting should have limited its thought largely to the military and those who immediately serve them; for examples, the workers in munitions industries and the citizens of nearby cities. But this duty having been discharged, let us remember that the backbone of a successful twentieth century war is the welfare of the general population. Irving Fisher is credited with saying that we will not know who has won this war until thirty years from now; not until such time as it has been possible to valuate the human wastage among soldiers, workers, children, the unborn—the racial stock generally. War places an increased strain upon those out of the ranks as well as those in them. At the same time the sources of strength to withstand this strain are apt to be lessened—less food, less play, less medical service. Such subjects can well occupy our thoughts in the wake of this most enthusiastic and helpful meeting.

It would be wrong not to allude to the impression made by the address of Mr. Hoover. Those not in attendance can read what he said but they cannot have the effect produced by his quiet, reserved, forceful presentation.

Dr. W. A. Evans
The Retiring President

Dr. Chas. J. Hastings
The New President

THE OFFICERS FOR THE COMING YEAR.

The following officers were elected at Washington for the next year: President, Dr. Charles J. Hastings; Vice-presidents, Dr. George M. Kober, Dr. Manuel Iglesias, and Dr. Guilford Sumner; Treasurer, Dr. Lee K. Frankel; Secretary, Mr. A. W. Hedrich.

The new president, Dr. C. J. Hastings, has made a reputation as health commissioner of Toronto. We have a right to expect that his administration will be active, vigorous and forceful. When the information came that Professor Gunn would be abroad for another year engaged in tuberculosis work in France, the members voted hearty resolutions of appreciation to our secretary and elected, as his successor, Mr. A. W. Hedrich, who, upon the recommendation of Professor Gunn, had been acting secretary during the unexpired term of Professor Gunn.

The highest praise was extended to the retiring president, Dr. Evans, for his courageous and efficient service. Universal regret was expressed that he was not free to accept another term, which had practically been offered through renomination by the Advisory Council. However, his election to the Executive Committee, together with Drs. Hurty, Bryce and Sumner, and the customary officers, will ensure continuity to the comprehensive plans for expansion of the Association, as presented before the Board of Directors.

The place of the next meeting was not designated, this being left to the Executive Committee to decide, in accordance with the exigencies of the war.

PROPER PAY FOR HEALTH OFFICERS.

Aberdeen, S. D., a city of 15,000, offers a salary of $2,000 for a medical health officer.

The announcement is encouraging. In the first place, we have a city of only 15,000 population departing from the custom of rewarding a war veteran—either military or political—with the local health office. Second, the salary is higher—not much higher 'tis true, but higher, nevertheless—than that which might be paid to the city hall janitor or the local dog-catcher.

Aberdeen may not be able to employ a physician properly trained in public health for $2,000. She will do well to eliminate the medical requirement, thereby opening the doors to a large number of well-trained sanitarians, well qualified to do the work, but without the medical degree. California recently set an example by employing three non-medical sanitarians out of a total of six employed as district health officers. That, however, is beside the point. What we wish to emphasize is that if larger cities appropriate on the same per capita basis as Aberdeen, a city of 30,000 will pay the health officer $4,000 per year.

As was emphasized by President Evans at Washington, the time has come for the Association to attack the salary question in an organized way. Speed the day when communities realize that public health is public wealth, and become willing to make an investment in the form of a reasonable salary for the health officer.

RED CROSS RELIEF INSTEAD OF CHRISTMAS CARDS.

A letter from a large cement manufacturing company in Chicago reads as follows:

"A number of companies in Chicago, whose custom it has been to distribute engraved Christmas and New Year cards, have decided not to do so this year, but instead to contribute the money to the Red Cross or other relief organizations where it will do real service.

"There is no reason why the movement should be confined to these lines or, indeed, to the City of Chicago. Many corporations and thousands of individuals throughout the country are now planning their form of greeting, and if the matter is presented to them in the right way by a country-wide publicity campaign hundreds of thousands of dollars can be diverted into relief channels where so much money is needed at this time.

"Another thing, the supply of labor in all parts of the country is wholly inadequate for necessary, important and productive enterprises. The successful outcome of this movement would release labor from non-productive and consuming enterprises which would be diverted into productive lines."

The idea is sound, and is commended to our readers.

HEALTH PROBLEMS OF THE ARMY.

SURGEON GENERAL WILLIAM C. GORGAS, U. S. A.,
Washington, D. C.

ONE would naturally surmise that, with the advent of war, the question of public health assumed lessened proportions in the mind of the military sanitarian. The problems incident to the care of the large number of sick and wounded soldiers would seem to be of sufficient magnitude to crowd out of military consciousness and relegate to a subsidiary position the management of the details of public health.

Such a supposition is totally fallacious. Indeed, in time of war the public health problem assumes even larger importance than it possesses in times of peace. With a small army (and in my early army-life days it was notably smaller than in more recent years) in times of peace the health of the civil community has an important bearing on the health of the garrison,—an importance that the sanitarian never loses sight of. However, in times of peace, the army medical officer always realizes the saving grace of being able to withdraw from a locality where health conditions assume threatening proportions. This procedure, a sanitary measure practiced in my early days, was always impressed upon the military surgeon, and particularly in regard to yellow fever.

Yellow fever was the disease most feared by our army stationed along our southern border; but we always realized that if the disease appeared in sufficiently grave form we would march away. Frequently, as sanitary adviser of a command, I have recommended this measure; for it was a well-recognized phenomenon of yellow fever infection that a command could strike tents, march a mile away from the infected site and pitch tents again in safety. After this maneuver, new cases would not appear for sometime, even though previously the disease may have been widely distributed. Often, if the command remained long enough, the disease would reappear, but in such an event it was fairly easy to beat another retreat.

For infectious and contagious disease, other than yellow fever, such methods were not resorted to, although, as may be readily seen, it was feasible to do so. The important point is this: we were moving away from the source of infection; and the source of infection was the immediately surrounding community. The ability of military commands—I am referring now to peace conditions in which, necessarily, our army meant small bodies of men—the ability of military command to remain under very adverse climatic conditions in perfect health as long as the community around them was in good health, can be illustrated by numerous examples. One instance has always impressed me very strongly because it bore association with the history of yellow fever. It was the expedition of Drake to Panama. Drake came to Panama in the latter part of the sixteenth century with a small command of about 100 men in three small vessels and hid himself on the coast of Panama. The northern coast is something like our Florida coast, covered by a succession of islands, which leaves a wide bay with many indentations behind the islands and the mainland. Now this region of Panama afterwards came to be looked upon as the most deadly part of the world. At the time I speak of, it apparently had not been infected; the natives were perfectly healthy. Drake and his men remained here for over a year without any particular sickness, making forays into the regions occupied by the Spaniards. After being there about a year, they went down to Cartagena, captured the city, remained there for two or three or four weeks plundering, then coming back with their booty to their little cove. Within four or five days after getting back, they began to sicken and, in the course of two or three weeks, one half of the command died. The epidemic then subsided and disappeared and the men that were left remained healthy until they left Panama. Evidently the disease that affected them was yellow fever, with which they became infected and carried back to Cartagena. The significant fact is that they could remain in this country which was afterwards looked upon as so deadly, for over a year, without a single death. The perfectly evident reason is that they were living in a country where the natives were entirely healthy; they then left, went to an infected point, came back and lost half their command. They still, for some reason, did not infect the community around them. The disease disappeared and they remained healthy for another year in this same locality.

How different the story of the sanitarian's activity in war times! How much more important becomes the question of the health of the community!

Our danger originally lay in bringing the troops into camp and introducing infection with them. Happily, the men have been encamped without any particular mishap. Now our problem is the prevention of introduction of infection from without. You will appreciate, therefore, how exceedingly important is the health of the civil population of the whole country, in relation to a military force, such as ours, numbering a million and a half men, engaged in training in various centers over the country. These men are in a perfectly satisfactory condition at present, as far as infectious and contagious disease are concerned. If we were in desert Panama, with no civil population around us, we should have no concern or anxiety with regard to maintaining this status of good health. Our problem now assumes the definite form of maintaining a low percentage of morbidity in a civil population, from whom by the very exigencies of the situation, we cannot march away.

Our danger will be from the same source when we go to Europe. We will probably have no particular difficulty in keeping the men free from infection as far as the camps themselves are concerned, if we do not get the various infectious and epidemic diseases from the population around us. It is, therefore, quite evident that the work and influence of an association such as this is more important to the military establishment in time of war, at this present time, than it is to us in time of peace. I, therefore, as the surgeon general of the Army, hope that this body will keep up the same effective work during the war that they have ever since I have been a member, and for years before, in times of peace. I wish to express my thanks to the Association for the part that they have already taken, and also my gratitude. You remember the definition of gratitude: a lively appreciation of favors expected (laughter). I express my gratitude to the Association in that sense, a lively appreciation of the assistance we expect to get in the next two or three years. I do not mean to predict that the war is going to last that long but, if it should be needed, for two or three years. I'd rather not make any prediction on that subject at all.

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Wartime Tuberculosis Plans.—The *Journal of the Outdoor Life* for September, 1917, contains several interesting pages of notes and gleanings concerning tuberculosis prevention measures which are planned to prevent further dissemination of this scourge because of the war.

Surgeon General Gorgas has established a department or bureau for tuberculosis with Col. George M. Bushnell in charge. Colonel Bushnell is one of the leading tuberculosis pioneers in this country; and he is organizing a corps of tuberculosis experts who are working in every army camp. All members of the National Guard and of the New Army will be given an examination by one of these experts and the discovery of active tuberculosis will bar a man from becoming a soldier. The National Association for the Study and Prevention of Tuberculosis has seized the opportunity afforded by the war for the furtherance of its splendid work. The association program consists of two general lines of work: First, a study of the situation in all of the army and navy camps with a view to organizing preventive work in each to be carried on by state and local tuberculosis agencies; and, second, in an endeavor to secure, so far as is possible, lists of men rejected from recruiting stations, camps, and the regular army on account of tuberculosis, and to arrange for adequate care of these men in their home communities.

In each state and in large cities and counties, war tuberculosis campaign funds are to be created, to be spent along the lines of education and organization, with a view to increase the city, county and state facilities for the care of tuberculosis.

Illinois, Wisconsin, and New York are among the states that have worked out and put into operation more or less complete programs for the control of tuberculosis based upon the necessities of war. Special educational measures are being employed in Illinois and Wisconsin; while in New York, twenty new county hospitals will be provided.

The National Association plans to give Tuberculosis Week for December 2 to 9 a decided war tinge.

PRESERVATION OF THE HEALTH OF THE SOLDIER ON THE WESTERN FRONT.

COL. T. H. GOODWIN, C. M. G., D. S. O., R. A. M. C.
Office of the Surgeon General, Washington, D. C.

Read before the General Sessions, American Public Health Association, Washington, D. C., October 19, 1917, for Col. Goodwin by Capt. J. Gilmour, M. C., R. A. M. C.

FROM the point of view of the commander of an army, the importance of the preservation of the soldiers' health can hardly be overestimated.

The fundamental duty of the Army Medical Service is to insure by every means in its power, that the requisite number of men in good physical condition are provided for the fighting line, that these men are kept in good health and that, if sick or wounded, they are restored to good condition and returned to the firing line as soon as they are fit for duty.

This being so it may readily be understood how important a part hygiene and sanitation play in the efficiency and fighting value of our army.

Prevention of disease in field armies has made enormous strides during the last fifteen years.

In previous wars our losses from preventable sickness have far exceeded our losses from battle casualties. During the present campaign this ratio has been very markedly reversed and the health of our army on the western front has, I am glad to say, been uniformly excellent, the loss from preventable disease having been reduced to a minimum.

Sanitation in the British Army is not a matter which is left to be dealt with solely and entirely by the medical officer, our regulations say that the officer commanding any unit, *e. g.*, the colonel of a battalion, is himself personally responsible for the sanitation of the area which his unit is occupying and that he will be held personally responsible that every individual under his command carries out all sanitary orders and regulations.

This is a very important ruling, and nowadays every combatant officer fully recognizes the value and importance of good sanitation and hygiene, and does all in his power to insure that recommendations made by the medical branch are carried out to the letter. He recognizes that, if this is not done, the efficiency of his unit as a part of the fighting machine, will diminish.

The chief diseases which affect our soldiery in the field, and against which we constantly have to be on our guard, are typhoid and paratyphoid fevers, dysentery, and cerebrospinal meningitis.

These diseases are all preventable but prevention cannot be efficiently carried out by merely issuing orders and making routine inspections. Every medical officer must be constantly and without relaxation on the watch for the earliest signs of occurrence of any of these diseases and must most carefully guard against any untoward conditions arising which might favor their incidence.

It is not possible, in the time at my disposal, to do more than briefly outline the measures for dealing with these diseases.

There are, as pointed out by Major Lelean, two essential methods for obtaining the information on which the necessity for action must be based.

(1) Accurate diagnosis:

This is not always an easy matter on active service, but has been greatly facilitated by the provision, in our armies, of travelling motor laboratories with full equipment for laboratory work. By means of this work the detection of 'carriers' (a matter to which I shall refer later), and the systematic examination of excreta in cases of diarrhœa, have borne excellent results.

(2) Accurate statistical record of the prevalence of preventable diseases.

PREVENTIVE MEASURES.

Constant unremitting attention must be the watchword of every officer in medical charge of troops or in command of units.

The potentialities of human "carriers" must never be lost sight of, the presence of such in a unit must be constantly watched for, as it is by their early detection that outbreaks of disease can be prevented or checked at the very outset.

As regards typhoid and paratyphoid fevers we may divide carriers into two classes:

(1) The "post-enteric" *i. e.*, the cases which have suffered from an attack of the disease. It is estimated that about two per cent. of these remain "carriers" for an average period of four years after they have recovered from the attack.

The organisms live in necrotic patches in the mucosa of the gall bladder. In this situation the organisms are protected both by the avascularity of the necrotic patches and the consequent inability of access by the antibodies in the blood, and also by the fact that the bile salts neutralize certain of the antibodies.

In the gall bladder the organisms live and multiply undetected, possibly for long periods, until a chance attack of diarrhœa with biliary discharge sweeps them into the intestines, and infective excreta result.

(2) The "contact carriers," persons who are in apparent perfect health and with no previous history of the disease.

Major Lelean points out that these may be liable to auto-infection from their own foci.

The importance of the infectivity of the hands of "carriers" must not be lost sight of. A very interesting case was that of a fo'c'sle hand who infected thirteen men through their handling the rungs of the ladder in reaching their quarters.

The following experiment was carried out in one of our enteric depots in India. A "carrier" was, without previous warning, made to stroke with his finger the surface of a culture plate. Five colonies of pure enteric organisms resulted.

DIFFICULTIES IN DETECTION OF "CARRIERS."

These are considerable. The odds against the discovery of bacillus typhosus in any single examination of the excreta are very considerable. From what I have said above, however, it may readily be inferred how important it is that those who are concerned with the preparation and handling of food or water should have their previous medical histories carefully inquired into and that such persons should be kept under constant observation. The occurrence of cases of diarrhœa in any unit should be immediately carefully investigated and the excreta of suspicious cases sent to the laboratory for examination. The above remarks have been made more especially with regard to typhoid and paratyphoid fevers, but the broad principles are equally applicable, to dysentery, cholera and diphtheria.

As regards cerebro-spinal meningitis, I should like to add a few remarks.

On the occurrence of a suspicious case, the patient must be at once isolated and placed under treatment.

His clothing, bedding and quarters must be disinfected.

All "contacts" must be segregated in well-ventilated quarters.

Swabs from the naso-pharynx should be taken—by means of a covered swab carrier such as West's—in the case of each "contact" and sent to the mobile bacteriological laboratory for examination.

Pending the result of such examination the men should be treated by nasal insufflation and gargles twice daily.

Those in whom the results are negative, and whose throats are normal, may return to duty. Any who are reported as "carriers" should be transferred for treatment and isolated until two successive swabs taken from the naso-pharynx, at intervals of several days, are reported as negative.

SANITATION IN THE FORWARD AREA.

The sanitary organizaton of units in the field is as follows:

A small detachment of Royal Army Medical Corps men is attached for "water duty" to each combatant unit in the field.

In addition to these every unit furnishes, from its ranks, a "sanitary detachment" consisting, in the case of an infantry battalion, of one non-commissioned officer and eight men. Both the "water duty" men and the "sanitary detachment" are at the disposal of the regimental medical officer and work under his command and direction. The supervision of sanitation of the unit of which he is in medical charge forms an extremely important part of the duties of every regimental medical officer.

Sanitary principles, methods and details have been very fully described in various text-books on the subject and I shall not attempt to do more than very briefly outline them.

(1) Food is brought as far forward as possible by motor or horse transport, and then distributed by hand carriage to the various regimental headquarters where it is cooked in dug-out kitchens and thence carried by hand, in jacketed hot-boxes, to the front line trenches.

(2) Water, purified by the addition

of chloride of lime, is similarly distributed, being carried to the trenches in empty petrol tins.

(3) *Conservancy.* The removal system is now practised in all trenches, the latrine buckets being carried back nightly and the contents buried in excreta pits.

Kitchen refuse is incinerated.

Flies constitute a pest which requires unremitting attention in order to prevent their gaining the upper hand.

Lice carry the virus of typhus fever, relapsing fever and most probably the so-called "trench fever."

This pest is dealt with by means of careful attention to personal cleanliness.

Infestation may largely be prevented by the use of powders such as "N.C.I." powder, naphthaline 96 per cent., creosote 2 per cent., and iodoform 2 per cent., and ointments such as "vermijelli" or crude oil ointment; the latter is the more effectual and consists of a mixture of two pounds of soft paraffin and four ounces of crude tar oil melted together.

The institution of divisional baths, which are worked in coöperation with arrangements for disinfection of clothing, has proved of untold benefit.

Each of these baths is capable of dealing with from 1,000 to 3,000 men daily.

Now gentlemen, from the above brief outlines, you may judge as to the magnitude and importance of sanitation as regards an army on active service. The more highly civilized a nation is, the more perfect its arrangements as regards water supplies and refuse, supervision of food supplies for the public, etc., the less equipped, as regards sanitary knowledge, will the population of that nation be should the country be suddenly plunged into war.

In peace time, and without prospect of war, all sanitary measures and problems have been ably dealt with by municipal and other authorities and the ordinary "man in the street" knows little or nothing of sanitation and its importance. This is the very man, who, after a comparatively brief training, is put into the fighting ranks of the army, and naturally, he, from his absence of previous training and knowledge, is handicapped, and unwittingly constitutes a serious menace to the health of the unit of which he forms a part. This applies also—though of course to a vastly less extent—to the doctors in civil life, who, on the outbreak of war, come into the army as medical officers.

They have, naturally, much to learn, and I think that there can be no greater tribute to the efficiency of general medical education and training than the able manner in which young medical men, with comparatively little special training, grapple with the complex problems of army sanitation.

Would it not be advisable for education in public health work and in military hygiene and sanitation to form a compulsory part of the curriculum of every medical student? Recent experience has shown us how important such knowledge is and how unexpectedly and suddenly the necessity for it may be felt.

SEWAGE DISPOSAL PROBLEMS OF A COAST SUMMER RESORT.

WILLIAM EUSTIS BROWN,
Formerly Health Officer, York Village, Me.; Instructor at Harvard-Technology School for Health Officers, Boston, Mass.

Read before the Public Health Administration and Sanitary Engineering Sections, American Public Health Association, Rochester, N. Y., September 7, 1915.

HUMAN nature is naturally conservative. So it is that the work of the modern sanitarian is often called into question, because of the fact that our fathers lived to ripe old ages without even the knowledge—to say nothing of the practise—of sanitary science. Thus when it becomes necessary for the carefully guarded water supply system to supplant the time-honored family well, and this in turn necessitates some system of water purification, the conservative element at once says, "Give him an inch and he'll take a yard." How little is it appreciated that it is the taking of this extra distance which spells progress—that new conditions are continually being created, which in turn demand new solutions.

In the same way, changed sewage conditions result from the installation of the public water supply. The per capita water consumption is increased, and consequently there is a corresponding increase in the volume of sewage. Cesspools become much more numerous, and tend to supplant the earth closet and the privy. The polluting contents are then liquid as compared with the former semi-dry matter. Because of the danger from overflowing and the fact that the construction of the cesspool may affect the few surviving wells, there is more or less of a constant menace. The next logical step after the introduction of the water supply is the building of a public system of sewage collection and disposal. In fact the two systems should be planned at the same time.

The summer resort offers a very difficult problem from the sanitary standpoint. Most of these resorts have gone through an evolutionary process. Usually they have had their beginnings as rough camps or as farm boarding houses, supplied with only such primitive sanitary conveniences as a sparsely populated country would require. Because of unusual location or remarkable climate, a rapid growth in population may have been experienced. With that growth, however, there is seldom a corresponding development in things sanitary. Consequently in many of our summer resorts there is found city crowding with extremely poor methods of camp sanitation.

In addition to this, another complexity is added to the problem in the character of the summer population.

Coming from all parts of the country and with the possibility of bringing any or all of the various intestinal diseases with them, the summer visitors' very often accept conditions which they would not abide in their winter homes. Possibly this last-mentioned fact may be due to the short stay of the summer resident or to the fact that in many instances he does not own the cottage or camp in which he sojourns. At all events the question of sewage disposal is given little consideration. So long as the odors are not offensive, and so long as his neighbors do not complain to the health department, matters are allowed to slide. These are curious facts, when one takes into account the facts that people usually go to the summer resort for healthful conditions, and that the price paid for the summer home is extremely high. In an effort to get "good air," the summer visitor loses sight of the facts that the summer months offer ways and means for the spread of intestinal diseases, which are not experienced during the winter months. Yet no extra precautions are taken.

Because of the nature of the place, the coast summer resort often offers very difficult problems either in the construction or in the operation of any system of sewerage. The scanty soil, the rugged shore line and the great abundance of ledge rock make construction most difficult. The contour of the land with its high elevations and long stretches of land below sea level make the planning of the system work for an expert. Where no public system of sewage collection and disposal is attempted, the construction and operation of cesspools and other sanitary devises may be quite difficult. Abundance of rock and scantiness of soil for seepage are the two trying features. Where the summer home is near the ocean, a private sewer is the usual means for disposing of the sewage matter. Owing to cost of construction, this sewer is laid on the top of the rocks. Not only are such unsightly, but they are always subject to being washed ashore in time of storm. At such times the sewage will be discharged above the high water mark and a nuisance is almost sure to result. Again, in the parts of the resort which are below sea level, there is not sufficient pitch to discharge the sewage into the sea and there is usually too much water in the soil to make the construction of a cesspool practical. In such places privies of the pail type or dry closets must be relied upon. Although these are usually built high above the ground, yet in the rainy seasons the high water floods them and carries the fecal matter into neighboring yards. During the past summer all of the cesspools and privies in a part of one town were flooded. While no sickness was traced to this source, yet after the draining off of the water most disagreeable odors resulted. With our popular beliefs as to the origin of typhoid, many were practically sick from fear of contracting the disease from the offensive odors.

The installation of private and public sewers, as well as of cesspools and privies, should always have in mind the danger of beach pollution. The beaches are one of the chief attractions and business assets of the shore summer resort. Everything should be done to keep them clean. Occasionally sewers are so poorly planned and constructed that fecal matter may be found on the bathing beach. This does not add greatly to the attractiveness of the bathing, even if it does not constitute a serious menace to the health of the individual.

In parts of the town where public sewers have been built, difficulty of operation may be experienced because of stupidity on the part of engineers in locating the same. Owing to the continual shifting of the sand, trouble usually results from sewers along a sandy beach. So long as the pressure of the outflowing sewage is sufficient, the sand is continually washed out, but as soon as the incoming tide exerts greater pressure, the sand is carried in and deposited in the pipe with the result that the outfall becomes choked. A makeshift is sometimes used to prevent this. It consists of a stream of water, which is constantly forced through the pipes. Besides being uncertain, there is a great loss of water. In case the sewer outfall becomes plugged, a length of pipe near the low water line must be taken up. The blocked pipe is opened by introducing a stream of water through an iron pipe. This can only be done at the lowest runs of tide and at each low tide work can be done for only an hour, so that the task of clearing the pipe is not an easy one. Owing to the great distance over which the sand extends, sewer outfalls in this region are not very practicable.

The difficulty of obtaining satisfactory sewage disposal is not confined to the parts of the resort situated along the shore. The outlying parts of the town encounter ledge rock, which not only makes construction of cesspools difficult but makes cleaning necessarily frequent. The usual result is that an overflow or a direct pipe is turned into a nearby stream of water, usually a brook, converting it into an open sewer. Soon the brook becomes clogged with a rank sewage growth, and the water drains off very slowly. From such places there develope during the summer months rank odors and an abundance of mosquitoes. Cesspools in ledge rock also offer a serious menace to the few surviving wells in the neighborhood. In one instance a new cesspool, fully a quarter of a mile away from a well, was found to be on the same seam of rock. As soon as sewage was deposited in the cesspool the same began to appear in the well water. Fortunately the discovery was made by analysis before any harm resulted.

Where houses are located on a river, the sewage is discharged into it. In coast resorts the river may empty into a small harbor, where space may be used by the fish-markets for floating fish and lobsters. Into this harbor many sewer pipes from cottages may drain direct. In this way the various sea foods may receive a continuous supply of fresh sewage. While recent experimental evidence may seem to indicate that the danger from this source is not very serious, yet the suggestive element still remains, and is of enough importance to warrant a change. Furthermore, owing to the fact that the grease in the sewage coagulates when it comes in contact with the cold water, the sewer pipes little by little become clogged. Finally there comes a great hue and cry from the summer tenants and after much effort the pipes are cleared and sewage matter is washed ashore for a few days.

Such are some of the problems of sewage disposal in coast resorts where no adequate system of sewage collection and disposal has been installed. Because each household must bear the expense of caring for his own cesspool, the same is usually neglected until a nuisance results. Cleaning cesspools is not an attractive occupation and demands extra compensation. The extra expense often influences people to allow them to go uncleaned. In a small community, where part of the houses empty overboard, there is usually not enough work to require the full time of a single individual. One of two conditions ordinarily results. Anybody takes a chance at the job and the sewage matter is spilled from one end of the town to the other, or one individual equips for the work, is licensed and receives a fixed compensation for the supervised work. Needless to say, the latter way is by far the better, but too often householders expect the work to be done for practically nothing. The end result of the cesspool system is that the health department has several hundred small systems of sewerage to look after instead of one. Cesspools in series, septic tanks, privies and individual sewers are at best make-shifts and almost always produce beach pollution.

The one solution of the problem, as experience shows us, is the construction of a complete system of sanitary sewers. This should not be undertaken until a very careful study has been made of local conditions. Too often town fathers have been persuaded by a "good practical man" to build a small stretch of sewer, which later has to be abandoned because of failure to take into account local conditions, growth of population or other parts of the town. The coast resort problem requires the best sanitary engineering skill available. The drainage areas must be carefully determined, so that excessive expense of construction may be avoided. Some of the land will be found below sea level, which will necessitate the installation of some sort of an automatic pumping system. The location of the various outfalls must be worked out so that there will not be even a suggestion of beach pollution. These outfalls should be out of sight. This may require an additional outlay in going through rock. Finally, during the summer months no raw sewage should be emptied along the shore. This necessitates some system of purification. The two most practical methods, which suggest themselves, are screening (or sedimentation) with disinfecting, and intermittent sand filters. In either case the measures of purification need be carried on only during the summer months, when the beaches are being used. During the remainder of the year the volume of sewage is comparatively small and may be bipassed without any nuisance resulting. In all of this work too much emphasis cannot be laid upon the necessity of obtaining trained men to undertake the work. All along our shores there are a good many monuments to the false economy of doing the work half way, resulting in badly polluted beaches, continual outlay of money, and dissatisfied people.

One reason why fewer communities take up this work is because of the large initial outlay of money which is usually necessary. Financial schemes have been devised whereby the expense of construction may be borne not only by the present generation, but also by generations to come. This is quite proper, for a properly installed system of sewerage will render service for many generations.

Where a single system of sanitary sewers is not able to be obtained for some time to come, the next best is a careful supervision of the other sanitary devises. Large cesspools in series have been found quite practical. By the use of the syphon only the liquid matter is carried over into the overflow cesspools, thus keeping all of the solid matter in the receiving cesspool and permitting larger seepage area in the overflows. The receiving cesspool will in most cases require cleaning but once a year. Septic tanks have in a few cases given satisfaction.

From what has been shown, the sewage problem of the coast summer resort is clearly a difficult one. Complexity is added because of the cosmopolitan population, the short stay of the same, the rapid growth of the summer colony and the difficult natural features encountered. However, every summer resort should appreciate the fact that excellent sewage disposal equipment is one of the first assets, which it should strive to attain. The day will come, and is not very far off, when the summer resort with overflowing cesspools, poorly kept privies or unsightly and ill-smelling sewer pipes will be looked upon as a poor place for health and recreation. On the other hand, the resort with a complete system of sewerage, which not only provides for the collection of the sewage, but during the summer months provides as well for the purification of the same, will receive the patronage of thoughtful and educated people.

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A Score Card for Barber Shops.—Score cards for showing conditions at dairies and markets have long been familiar to sanitarians, but a barber shop score card is somewhat of a novelty. Believing, however, that these shops are of sufficient importance to warrant occasional inspection, Health Officer James A. Tobey of West Orange, N. J., has devised such a card. It is divided into two parts, "equipment" allotted 40, and "methods" allotted 60 out of 100. In an endeavor to concentrate on important points, there are only fourteen items, the principal stress being laid upon sterilization of all utensils after each use, washing of hands before attending customers, clean individual towels, and employees who are clean and free from disease. The card seems to have had a beneficial educational effect and inspires a sense of rivalry. Shops have usually scored high on equipment and low on methods, but a change for the better according to the standards of the card seems to be on the way.—*Submitted by James A. Tobey, Health Officer, West Orange, N. J.*

THE HOSPITAL AND INDUSTRIAL HYGIENE.

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THE first relation of the hospital to industrial hygiene is in the obligation of the hospital to provide for the study of industrial disease. This obligation is the more imperative because of the prevalent ignorance among physicians of the hazards of various occupations and trade processes and of the ill health dependent upon such hazards. The failure of American industry to develop adequate standards of industrial hygiene has been due in great measure to the medical profession's almost complete neglect, until very recent years, of the problems of industrial medicine. It is obvious that no sound and rational hygienic measures can be instituted in industry unless they be warranted by honest and scientific observations upon the effect on workers of occupational health hazards. Studies of this nature have been made in but few industries and by few persons. We can, indeed, borrow from the experience of other nations, notably England and Germany, but there are many problems peculiarly our own, and any problem in its local setting becomes a new problem. The distinctive characters of the hazards of American industry are dependent in part, of course, upon a difference in manufacturing methods and processes, but even more upon differences in wage scales, standards of living and the economic and social conditions related to industry and industrial community life. Because of the hospital's exceptional opportunity to observe the effects of hazardous trades upon the working men and women coming to its clinics and wards, the hospital can contribute much toward a true conception of industrial disease, and in so doing does it establish its most vital and essential relation to industrial hygiene.

The cause of sickness among workers is rarely to be determined by such a simple investigative measure as factory inspection, and it is becoming more and more apparent that industrial hazards are for the most part rather ill defined etiological agents in disease, and that industrial disease must be studied by the same methods of scientific medicine which are applied to the diseases of persons out of industry, with the same painstaking care, but with an even wider knowledge of possible causative factors and an even deeper delving into collateral economic and social relations. In a study of the causes of debilitating disease among garment workers, for example, it is fully as important that due emphasis be placed upon an investigation of living conditions, individual and family income, nutrition and personal hygiene, as upon consideration of shop ventilation, faulty posture, or noxious fumes from gas irons. The problem of pulmonary disease among textile workers is but a part of the problem of pulmonary disease in the homes of persons who happen to be operatives in textile mills.

There are few medical conditions which, in their study, do not warrant consideration of possible industrial aspects. It is as important to know under what strain the "compensation" of a case of heart disease was broken as to know the cause of the original damage to the heart. Most surgeons can unhappily recollect certain appendectomies or operations for intestinal obstruction strangely associated with sundry lead hazards discovered after operation. Pediatrics is possibly the only special field of medicine which is not frequently concerned with phases of industry, and it, indeed, is not wholly unconcerned because of the visitation of misfortune upon the children of many of those who labor under unhealthful industrial conditions. The fundamental medical sciences, as physiology, pathology, and biological chemistry, are as definitely involved in the study of industrial disease as are the branches of clinical medicine, but all of these must be supplemented by a third critically important element, namely, knowledge of actual working conditions and of the hazards of specific industries and trade processes. The importance of special, first-hand knowledge of industrial conditions cannot be too strongly emphasized, for without it important evidence is frequently overlooked or wholly misinterpreted, and the lack of such knowledge has been responsible for much of the almost worthless work, published and unpublished, upon problems of industrial hygiene. In many cases social investigation will be found very necessary, and it always offers a valuable check upon other findings. This is especially true in regard to tuberculosis and in the large group of cases presenting evidence of nerve strain and those of debility of uncertain origin.

There are several reasons why the hospital is peculiarly able to contribute to the new knowledge of industrial disease. While that which is to follow is applicable in some degree to almost any hospital, it applies particularly to the larger hospitals in industrial centers and to institutions embracing outpatient clinics.

Obviously the equipment of a large hospital, with its specialized staff, its various laboratories and resources, renders possible research in industrial disease at a cost which is but a small fraction of that required for the maintenance of a special, independent institution such as has been established. The adult patients coming to general hospitals are for the most part men and women in industry, and the very volume of attendance alone offers much valuable evidence in the study of the diseases of occupation.

While it is true that in health surveys of industrial plants, if incidental medical examinations be made, there may be revealed cases of industrial diseases, especially in its incipiency; it is also generally recognized by those who have attempted such investigations that the reserve of most workmen regarding their subjective symptoms is for various reasons rarely to be broken, and in consequence satisfactory, accurate data are seldom and only with difficulty to be obtained. Men usually "move on" from a factory or a process which they suspect or know to be, for them, a dangerous one, and into a presumably safer field of endeavor. In such a case the plant survey misses a valuable index to a disease-producing hazard. It is, however, just such cases which come in great numbers to hospital dispensaries and into the hospital wards, those "down and out" as well as those just starting down. If in the hospital full inquiry be made into the occupational history of the patient and the facts so obtained be intelligently correlated with the physical findings in the case and with proper data relating to the industries concerned, evidence of the greatest value must result. It is knowledge of this kind, accumulated in one institution or in many, by industrial physicians, by special investigators, and by private practitioners, which, classified and interpreted, is and is to be after all the only effective and just means of securing the advances in the prevention of industrial disease now so truly needed. It is readily to be seen that there is urgent need of better occupational statistics in hospitals, and they are to be obtained by the simple means of careful, intelligent inquiry where now there is unintelligent carelessness. Such statistics contribute not only to a higher standard of medical practice in the institution itself, but also very materially toward the success of efforts to eliminate the causes of industrial disease.

There should also be considered the fact that, by virtue of its position in the community as a seeker after truth and opportunities for service, the hospital is able as are few other agents to study the problems of industrial disease without the bias which does and must almost inevitably affect to some degree the researches of many men engaged in clinical work in industrial plants. There must be maintained in the hospital the most scrupulous standards of scientific honesty and a reasoning sense of fairness to both the patient and the patient's employer. With a reputation for invariable fair dealing the usefulness of the hospital in the field of industrial medicine is unlimited; but with a questionable reputation such an institution is wisely avoided by workmen and employers alike.

The second important relation of the hospital is in its obligation to teach the principles of industrial hygiene and industrial disease. There is among physicians a growing sense of their responsibility as teachers of better habits of life and work, and hospitals in like manner are becoming more truly educational centers in preventive medicine.

As new knowledge of industrial disease and its prevention is gained, the hospital should provide for the extension of such knowledge to its own staff or at least offer opportunity for that extension. If the hospital is affiliated with a medical school, there should be offered to medical students suitable instruction in this subject, preferably of a clinical nature. The continued progress of industrial medicine, of course, depends upon the future interest and efforts of men now in medical schools.

There is an increasing demand for nurses in industrial plants, in part because it is the fashion of the day to institute "welfare work," in part because of the realization of the great usefulness of plant nurses, if they be given opportunity for usefulness. This demand will surely not decrease. If industrial nurses are to be properly prepared, nurses in training in either their regular or a postgraduate course must be schooled in the larger aspects of the problems they may face in industry.

Social workers, who are persons having much to do with both the immediate and end results of industrial health hazards, in almost any special province will work more efficiently if they have some knowledge of the physical effects of labor on the working man and woman and some knowledge of good hygienic standards.

Much may be accomplished with the individual patient by instructing him regarding the dangers to which he is exposed and the precautionary measures indicated. It is impossible accurately to reckon the usefulness of such instruction. It seems to parallel the parable of the sower. The lead poisoned litharge packer may return unconcerned to his packing forthwith, and the painter may for some days depart from his evil ways of lunching with paint-daubed hands, but in rare instances a circular of precautions for printers is reprinted and widely distributed, that it may be of benefit to many men.

A valuable extension of industrial preventive medicine is that which carries knowledge of the dangers of particular trades and processes, and knowledge of ways to avoid such dangers into the meetings of labor organizations and into the offices of employers and factory superintendents.

Another service for the industrial clinic of the hospital is in the field of vocational guidance, not alone for the youthful but for workers of all ages. Vocational guidance far too often results in a change of occupation. It should in most cases mean an adaptation of the workingman's methods of living and working to conform him to his old job, or to the old job made a less harmful one. Vocational guidance is a most important function of the medical profession, and it is such no less now of the hospital clinician than it has been of the family practitioner. No physician should prescribe for his patient a job regarding which he himself knows little or nothing, any more than he would prescribe for his patient an unknown drug.

The relations of a hospital to industrial hygiene may be many. For any individual hospital such relations must be limited and defined according to that hospital's industrial environment, the resources available, and the interest and time which can be devoted to the subject. But for any investment of effort, whatever it may be, the return is always overwhelmingly great.

MILK SUPERVISION AND ITS CONTROL.

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THE term "Milk" is from the Greek word meaning to press out with the hand and has come into general use in describing that fluid by which nature has made possible the continued existence of the human race.

Very little authentic information regarding the domestication of the cow is available. Wherever we find her mentioned, even in the earliest history, she was already in a state of servitude to man.

Just when or where the two met is very largely a matter of conjecture. It seems certain, however, that man found the earth populated with other wild creatures, among them the herbivorous ancestors of the present dairy cow. He must soon have observed that these grass-eating creatures were endowed by nature with that upon which their offsprings seemed to thrive.

I believe that the calf was the first dairyman and an object of interesting observation to the human creature looking for that with which to satisfy his ever-returning hunger.

It is a far cry, however, from those days when our ancestors drank the milk of the cow and called it good, to the present day, with the milk situation facing us in all its complexities.

Hamlets have grown into towns, towns into cities, and the cities have become great manufacturing centers, the workers in them depending upon workers in the country to furnish a milk supply.

Cities are concerned about the health of their people. Health officers have been appointed. Statistics on the death-rates from the different diseases bring several interesting facts to light. One of the most startling is the discovery that diseases are sometimes transmitted through the milk supply. The city's interest in its milk supply is here to stay, and efforts are being directed toward improvement from the community rather than the individual point of view.

The work of obtaining better milk for a city or town is second to none in importance, and if done at all, is worth doing well.

Whether through acquired taste or custom, because of a growing appreciation of its nutritive value, or because of its palatability, milk now occupies an important place in the diet of the people of the United States. According to estimates, consumers in this country pay out annually, for milk, the enormous sum of more than one billion dollars. These figures exceed the value of all the gold and silver taken from the mines of the world during the same period. One is impressed with the size of the industry.

Great sums of money are being expended in preparation for the handling and sale of still greater quantities of milk, which seem certain to follow. The rate of this increase will no doubt be influenced in no small degree by the consumer's opinion of its purity, freedom from disease, and his appreciation of its relative cheapness when considered from a food-value point of view. We may safely say that the milk industry will advance accordingly as it is standardized, its products made safe and their nutritive qualities brought to the attention of buyers through education; hence we see the vital need of milk supervision.

I do not like the word "inspection," for it seems to me that, if the best results are to be obtained, the milk supervisor should be to the consumers what the doctor and the school are to the family, and should do for the dairyman and the milk supply what system does for the factory, being mindful of the health of the former and educating them to appreciate good milk when obtained, recognizing the handicaps and intricate problems of the latter and assisting in overcoming them.

Regarding the producer's ability to produce good milk we find an international committee saying, "This committee believes that the production of a clean and reasonably safe milk is a comparatively simple process easily within the reach of all careful dairymen, if paid a price sufficient to induce them to become genuinely interested in its production."

Out of a full realization and understanding of this situation should come a few rules, necessary, workable, enforceable, and easily understood.

It seems to me that regulations which correct no faulty condition or bring about no improvement in the milk supply or dairy conditions, should be regarded in no other light than as a burden to the cause of better milk. Vicious regulations are to be avoided. Only through regulations drafted with intimate understanding of the field to be covered can best results in improving the milk supply be hoped for.

Personally, I like to think of regulations constructed and applied, so far as they can be, like a machine, the work to be done to determine the size of the machine; the whole so constructed that each cog and part while in motion will do what that cog or part was constructed to do; and so that when the work which each was molded to perform is finished, that particular part will immediately cease to draw on the power, and not hamper the movement of other parts or embarrass the smooth working of the whole; like the construction of a watch, not a wheel too many, not a cog too few, no duplication of effort, no jar or loss of motion.

By this I mean, let the inspection be done by one competent authority. Too many cooks spoil the broth. Unnecessary visits to the dairy by this authority should be avoided, for these visits usually needlessly take up the time of both producer and inspector. In other words, have a system which will tell you when things are going right and when wrong, and that will point out the place in which they are wrong. A definite plan of action is to be preferred to a hit-or-miss method of dealing with factors which determine quality in milk.

While rules and regulations in themselves have no mysterious power of bringing about improved conditions, when to these are added the efforts of a competent supervisor, they do become of value in securing better conditions in milk production; for the washing of udders, the sterilization of utensils, use of the covered pail, immediate cooling and the like, seldom come of themselves. Few of us, of our own initiative, do the best we know.

By turning to the statute books we find that we have both dictatorial and suggestive powers. Experience teaches us that the latter is the more powerful of the two in obtaining results. In a few cases the law has to be applied, but recourse to this should be resorted to only after all other channels have been tried.

The supervisor's relation to the dealer must also be coöperative and cordial, for he is aware of the fact that it is the producer and the dealer, not he, who actually handle the product and determine the effect of this handling on the quality of the product supplied.

Perhaps the work of obtaining a reasonably safe milk supply has been no greater in this country than in others; however this may be, it is a fact that we have taken much interest in the matter, and are perhaps further advanced in the problem.

To obtain better milk we must make it possible for producer A, who furnishes better milk than producer B, to get a better price. This means that consumers must appreciate the better milk in a financial way.

They who would be most successful in improving the milk supply of any city or town should realize that the quality of the four billion gallons of milk annually supplied our population of more than one hundred million is, and can still further be, influenced by our five million dairymen and their helpers, who in the day soon to close and in the morning yet to come, will arise, and through what they do or leave undone will determine the effect of this handling on the quality of milk which daily leaves their farms.

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Volunteer Aids of the Health Department.—Dr. Edgar H. Guild, health physician of Springfield, Mass., writing in *The American City* for September, 1917, describes a children's organization known as the "Home Helpers' League" which is proving very popular and successful in that city.

A league is formed in each of the graded schools and the membership is limited to girls of eleven years and upwards. Regular meetings of each league are held and at each meeting a nurse gives a short talk on the care of the baby, personal hygiene, care of the hair and teeth and general sanitation as regards the cleanliness of the city.

The members coöperate with the Health Department by reporting sick babies, dirty back yards, flies, garbage cans in improper order, and refuse.

The vacation time is made the period of intensive instruction while the work goes on throughout the year with somewhat lessened intensity.

The great increase in the numbers of reports of various kinds, visits, and talks and demonstrations at meetings of the leagues show fully the value of the leagues to the Health Department.

MOSQUITO GROWTH IN CATCH BASINS.

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CAMBRIDGE, Massachusetts, is infested with mosquitoes. In the summer months one cannot sit out without the protection of screens without submitting to the annoyance of these buzzing, biting insects. In the regions to the north and west of the city there are swampy districts which abound in breeding places but these are at a distance of a mile to a mile and a half from the center of the city, which is free from any bodies of standing surface water. The regions in question are within a half mile of the Charles River, but as this is a large flowing body of water with clean shores it does not seem that many mosquitoes should arise from this source.

We believe that mosquitoes do not fly to great distances unless carried on the wind. In the case of central Cambridge, therefore, breeding places must be near by to account for the great prevalence of the mosquitoes. A survey of the back yards carried on by the Boy Scouts indicates that the back yards within a half mile radius of the University are reasonably clean and certainly free from tin cans and the sort of rubbish that provides many sources of standing water. To a large extent the houses are in such condition that it is reasonable to suppose that the gutters do not offer sufficiently large breeding places for the numbers of insects present.

A possible source, and by process of elimination the most probable source, is furnished by the catch-basins which are placed at nearly every street intersection to catch the surface drainage from the highways. There are about two thousand such basins in Cambridge scattered over an area of about eight square miles. These basins vary slightly in capacity but have on an average a water surface of 22 square feet. The depth is about 2 feet 4 inches.

In the investigation undertaken to determine what part these basins play in serving as breeding places for mosquitoes there were evidently several points to determine:

First: Do these basins serve as breeding places?

Second: If they do, do mosquitoes breed in them at all times of the summer season?

Third: What effect does rainfall have in changing the water in these basins?

Fourth: How can this source be mitigated?

During the summer of 1914 a study was made of eighteen basins situated on various grades of streets. Some were on well traveled, well paved streets; others on streets having a mediocre macadam surface; one on an unaccepted lane at the intersection with a through traffic street.

Through the coöperation of the street department these basins were cleaned by a squad of city workmen in the usual manner during the first few weeks in April. The inlet to each basin was stopped with a plank and the water bailed out with a pail on a rope. A workman in hip boots then descended into the nearly empty basin and removed any accumulation of sticks and leaves or other rubbish from the outlet. The basins of the whole city are thus cleaned once a year as a matter of routine. On April 24 a personal inspection of several of these basins was made.

The outlet to the sewer from these basins is in all cases through some sort of trapping device which allows water from below the surface to flow out and which carries out the surface water only as it is displaced and mixed with the lower layers by incoming drainage.

The procedure followed in the investigation consisted of taking a measured sample from each basin in such a manner as to include only surface water insofar as possible, and transporting it to the laboratory where it was transferred to a battery jar for observation. It was felt that, inasmuch as the mosquito larvæ when undisturbed remain for the most part at the surface of the water, such a sample when examined for the presence of these wrigglers would give a fair indication of the number breeding in each catch-basin at the times of sampling. If these periods of sampling could be so arranged as to occur once per generation of mosquitoes, the season's catch would give an approximate comparative computation of the number breeding in the various basins throughout the season.

Various sampling devices were tried, each designed to take surface water only and to take the sample quickly. At first attempts were made to take a large quantity of water and strain it through cloth to concentrate the sample. This was impractical because of the large mass of rubbish always present which collected on the strainer, effectually hiding any mosquitoes or larvæ. Finally a tin can on a stick was adopted as the best sampler.

The man-hole cover was lifted off and a few seconds allowed for things to quiet down. The sampler was then lowered quietly to near the surface of the water and quickly plunged under to a certain mark and swept with the same motion in a lateral direction. By this means the sample taken was of surface water largely and there tended to sweep in with it any floating matter which was reached by the current created, including of course mosquito larvæ, eggs, and pupæ.

Later it was observed in a glass vessel that mosquito larvæ come up principally around the edges, so that a preliminary stirring up of the water in the basins was resorted to, to scatter the wrigglers, followed by a period of quiet long enough to allow the larvæ to return to the surface. From time experiments in the laboratory it was found that the larvæ stay under only for a short time when suddenly frightened, at most not more than 60 seconds, and usually not more than 30 seconds. At least a minute, therefore, was allowed to elapse between stirring up the water and taking the sample.

One half gallon samples were taken in this manner and transported to the laboratory in glass stoppered bottles in cloth bags. Notes were taken of the appearance of each basin during the short interval of waiting.

At the laboratory each sample was emptied carefully into a numbered battery jar and observed once a day for the appearance of larvæ or pupæ and the number recorded. Netting over the top of the jars served to entrap any insects that hatched out between periods of observation. Corrections were made for instance when a larva changed into a pupa or a pupa into an imago and in this way the corrected larval total for the week was taken as the index of the number of mosquitoes that would have hatched from that sample of water that week. It was judged that any eggs laid soon after the taking of a sample would appear in the next week's catch. From observations made in the laboratory it was assumed that the average time from egg to imago was on an average about seven or eight days, rather than the longer period of ten days more often assigned to this phenomenon in the literature. It was evident that seven days is sufficient time to carry the egg to the larval stage and to carry the young larvæ to the imago stage.

Inasmuch, therefore, as this work consisted in an enumeration of larvæ, largely, it was considered satisfactory to allow a period of time to elapse between samples sufficient to graduate the larvæ of one sampling period to the imago stage before taking the next sample. One week was, therefore, adopted as a convenient and suitable period of sampling. The method of computation adopted was considered to be accurate enough, considering the many possibilities of error in the procedure, to give at least a comparative result from week to week and between basins under various conditions.

A tabulation of the season's catch with the rainfall record of each preceding week and a daily temperature record was made at the end of the work.

On May 4, after six days of dry weather, the first catch of the season was made. One larvæ was captured in one basin. This was computed to represent twenty-two larvæ in that basin. The mean temperature was about 60° on that day.

No more wrigglers were captured until May 27 when larvæ were found in five basins. This was at the end of a hot, dry week and the temperature on the day of sampling was from 74 to 95. From 40 to 350 larvæ were indicated in each basin that yielded any at all.

The following sample day was cold again having a mean temperature of 60° and followed three rainy days, the heaviest fall being the morning of the sampling day and consisting of a smart shower with a precipitation of .1 inch. No larvæ were captured in any basin.

On June 10 three basins showed the presence of mosquitoes, and following that date, until July 29, only one basin yielded any at all, that one basin never failing to give a crop of from 30 to 150 per week as indicated by our method of sampling.

On July 29 seven basins showed the presence of wrigglers, and all during the month the crop was fairly heavy. Temperature ran high and the showers occurred for the most part early in the sampling week or not at all.

With the beginning of the month of September, for no evident reason, the number of basins yielding mosquitoes dropped to one and the number in that to one.

On September 16 the last larva was captured and on September 29, after two blank weeks, as the temperature was down to 46 the hunt was declared off.

It was found that we had direct evidence of the breeding of some 5,500 mosquitoes from eighteen basins of which 1,300 were from one basin alone. One basin failed to yield any during the run and one basin yielded only one for the season.

The total number did not at all fit with preconceived ideas and in the opinion of the author is not trustworthy as an indication of the quantity that actually were bred, because of the many chances for error in sampling.

There are, however, certain inferences to be drawn from the results obtained which are suggestive. One basin was a consistent producer of mosquitoes throughout the test and never failed to produce larvæ if any other basin did. When no larvæ were found in this basin, none were found anywhere else. The notes of the observer, taken at times of sampling, seemed to give the answer to the question raised by this apparent abnormal condition, and information from the street department was corroborative of the explanation deduced.

All the streets in the neighborhood under investigation are in the summer time oiled to keep down the dust. Inasmuch as the street surfacing of Cambridge is, for the most part, macadam there is considerable dust to keep down. Consequently the streets are oiled early and often during the summer. Naturally the city does not go to the expense of oiling any unaccepted streets.

The basin which yielded the steady crop of mosquitoes was on an unaccepted street. The other basins were on accepted city streets. The note book record of observations shows that in all the cases, except the one prolific basin mentioned, there was usually evident upon the surface of the water in the catch basins a more or less thick oily scum. The basin which supplied the mosquitoes did not have such a scum. It was reasonable to suppose that this scum comes from the excess oil which runs off or which is washed off the roadway into the basins. Apparently the catch basins in Cambridge are, for the most part, kept automatically oiled by the street department, and where such is the case they do not serve as breeding places for mosquitoes to such an extent as they otherwise would.

CONCLUSIONS.

The conclusions which may be drawn from this investigation are as follows:

(1) Under ordinary conditions catch basins can and do serve as breeding places for mosquitoes.

(2) Depending on the season, mosquitoes may be expected to breed in catch basins in places of the same climatic conditions as Cambridge, Mass., from May to September.

(3) A sufficient amount of rainfall serves to wash out the basins to some degree and rid them of eggs and larvæ. This need be only .1 inch of precipitation if it be brisk.

(4) It is evident that oiling is efficient in reducing the number of mosquitoes coming from this source, and it appears that in some cases oiling of the streets to keep down the dust serves automatically to oil the catch basins.

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BRITISH MEDICAL PROFESSION APPROVES HEALTH INSURANCE.

How does the medical profession in England, after five years' practical experience, regard the Health Insurance Act? "Favorably," finds the British Medical Association after a painstaking inquiry among all local branches and panel committees. And, the Association's Committee remarks, "the degree of unanimity so far disclosed is somewhat remarkable."

The report, which has appeared in the *British Medical Journal*, points out minor defects in administrative detail that may be easily corrected and suggests that the scheme, which is proving a distinct gain to the medical profession as well as to the public health, be still further expanded.

The most important improvements recommended by the Committee and adopted at the Annual Representative Meeting of the Association relate to provisions not found in the existing British Act but contained in the tentative health insurance bill prepared by the American Association for Labor Legislation in coöperation with the American Medical Association, and now being studied by official commissions in eight states in this country with a view to legislation. These provisions, now found desirable by the British doctors, include the extension, under certain conditions, of the advantage of medical care to dependents of insured persons, and also the extension of the scope of medical benefit to provide *all* necessary medical care—specialists and nursing services, institutional treatment, maternity attendance, etc.,—instead of only that which can be furnished by the general practitioner.

Perfection of the existing panel plan and of the basis of payment for medical service is recommended, as against any immediate consideration of a new system in the direction of a state medical service, though the Association recognizes the need for an extension of the number of salaried medical officers in the field of preventive medicine.

NEW IDEAS IN FOOD CONTROL.

Harry E. Barnard, Ph. D.
State Food Commissioner, Indianapolis, Ind.

Read October 25, 1916, at Cincinnati, Ohio, before a Special Meeting for Members of A. P. H. A., Interested in Public Health Aspects of Food and Drug Control.

THE time is opportune to discuss the history of pure food legislation, to detail the development of our present system of food control from a more or less political and altogether unsatisfactory dairy work of a quarter of a century ago. But I do not propose taking up valuable time with an historical discussion, and I shall establish a basis for my remarks with the assertion that present day food control is an endeavor to protect the public health by supervising the conditions under which the food supply is produced, handled and distributed.

The food department whose only effort is exercised for the prevention of food adulteration is occupying a minor field, is letting lie fallow or untilled a world of opportunities. Food adulteration is, save for the occasional lapse of ignorant offenders, a thing of the past. Food sanitation is the work of the present; the nutrition of the human family, the work of the future.

You who have gathered here to discuss foods and drugs are vitally interested in the problem of sanitary food control. You are, no doubt, already enforcing excellent sanitary food laws. You are providing for the protection of the food supply during the process of distribution just as carefully as you are watching its manufacture and eliminating unfit raw material. You are studying the health of the employee in the food factory, and if you are not already requiring a certificate of sound health from every worker with food, you are planning legislation which will enable you to throw this last and vitally important protection around the food supply. What we all thought but a few years ago was an impossible task has been successfully accomplished in the great city of New York, and what the department of health of that city has done, every state and city official ought himself to be able to do.

Recognizing the fact that typhoid fever, although it may be, and frequently is disseminated in an infected milk supply, by polluted water and through the common fly, is more frequently than we care to contemplate, a product of a human carrier; the food official working in the larger field must find a means to eliminate typhoid carriers from the ranks of food handlers. Whether we want to acknowledge it or not, the fact still remains that much of the typhoid which we have always with us is not due to the fly, is not due to the unsanitary outhouse, is not due to the polluted well, but it is due to the cook, to the waiter in the restaurant, to the helper in the dairy.

We have found a way to get at these facts and to eliminate the source of the infection. This is real work for the food inspector and a real function of pure food legislation. And now we are ready to plan for the future. Enormous strides have been made in recent years in the study of the nutritive value of foods, but it is only since Osborne, Mendel, McCollum and their associates began to give us the results of their studies that the new world of scientific feeding, potent with possibilities for a better nourished race, opened before us.

There is more than passing interest in the fact that practically the only real studies of nutrition reported up to a few years ago were confined to the investigations of animal nutrition. The human family has been allowed to eat as casually as it has been permitted to mate. Fortunately the problem of feeding an animal and of a human is not greatly different, and when we have learned in our investigations that a hog cannot be successfully fed upon a single ration such as of corn or wheat, we have at the same time discovered a truth of value in the feeding of the child and of the adult. The ability of animals to utilize foodstuffs varies. The sheep thrives on food the dog cannot utilize at all. And yet the basic principles governing nutrition are in the last analysis as definite as the reactions in the test tube of the laboratory. The functioning of the living cell has not yet been explained, but we do know that the processes which go on within it are chemical processes which are varied, interrupted or accelerated just as are the processes with which the chemist is more familiar. Food officials have not had an opportunity to study this proposition. Their field of effort has been very largely given over to executive work.

I believe the future will see research laboratories, skilfully officered, built up as an important function of the food official's department. Such laboratories will discuss the problems of nutrition not only with a view to a better nourished race but to the end that we may be better fed at more reasonable cost. The average housewife in her buying is governed by her likes or dislikes rather than any real knowledge of food values as interpreted in terms of nutrition or of cost. The food official who wishes to serve best will do what he can to guide her in her buying. We are today approaching a crisis in food prices. Look where you will it seems it is impossible to find a single article of food which is really cheap. Of course certain foods are relatively cheap. Wheat at three dollars a bushel will yield a relatively cheap food. The work of the food official may well be directed toward informing the housewife who buys for the home what to buy that she may feed her family well and cheaply.

These are the things the food officials should do. And it is in the development of these new ideas, and by his entry into these larger fields, that he can best serve the community in which he works and build up a department which will do constructive instead of police work.

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Court Plaster Examined for Tetanus.—Following the reports published in many of the newspapers, that specimens of court plaster sold in the West by itinerant vendors had been found to contain tetanus bacilli, the Department of Health, through its Bureau of Laboratories, examined a large number of specimens of court plaster sold in this city. In not a single instance were evidences discovered by any infection with tetanus. In the case of the positive findings reported by the newspapers, it is, of course, extremely improbable that this represents anything more than accidental infection. Certainly no one at all familiar with tetanus and attempting in such a fiendish way to kill his fellow-men with the germs of this disease would resort to court plaster as the vehicle of infection.

While, therefore, we do not take any stock in the suggestion that court plaster is being deliberately infected, we would advise the public to buy court plaster only from reputable druggists, and only the product of reliable manufacturers.—*New York City Weekly Bulletin*, August 18.

REPORT OF THE COMMITTEE ON STANDARD BACTERIAL METHODS FOR MISCELLANEOUS FOOD PRODUCTS.

THIS committee has considered the subject of bacterial examination of eggs and egg products. Through a circular letter all members of the Society of Bacteriologists were acquainted with the purpose of the committee and their coöperation secured. Many valuable opinions were secured through correspondence and personal visits. As a result of the work your committee recommends the following procedure for routine bacterial examination of eggs and egg products:

SHELL EGGS.

For the routine work of a laboratory the bacteriological examination of shell eggs is not recommended, because in the enforcement of any law or regulation the bacteriological examination of a shell egg would have reference to the individual egg and give no definite relation to any of the number of individual eggs in the lot under examination.

Shell eggs are graded commercially by inspection either before the candle, out of the shell, or both. A trained person can distinguish the various grades of eggs by this method and can pass upon the sanitary quality with a reasonable degree of accuracy.

Eggs which appear good before the candle and whose shells are free from dirt, cracks or checks, are comparatively free from bacteria, at least, the small number found could not be considered of importance in determining the sanitary quality. High bacterial counts are found only in eggs, the inspection and candling of which would indicate that they were heavily infected or at least unfit for a food product.

For research work or special investigations where the bacteriological inspection of shell eggs is required, the methods of Pennington (U. S. D. A. Bul. 51) or Rettger (Storrs Agric. Exp. Sta. Bul. 75) will be found satisfactory.

EGG PRODUCTS.

SELECTION OF SAMPLE.

Desiccated Eggs. Each sample should consist of at least one-half (½) pound. Samples should be collected from representative containers of the product in any individual shipment. The samples should be drawn from the package at least six (6) inches below the surface and by means of sterilized utensils, and placed in sterile containers.

Frozen Eggs. Frozen egg samples should constitute original unopened packages whenever possible. This should always be the case when the sample is to be forwarded to a laboratory by express for examination. When a sample is collected by a bacteriologist for immediate examination, one-half pound samples are sufficient. The samples should be taken by means of sterilized utensils and placed on ice in sterile containers. Samples should be collected from representative containers of the product in any individual shipment. It will be found convenient to use a sterile butter sampler of sufficient length to enable one to remove a core of the frozen material from the top to the bottom of the container. If the material is frozen too solidly, it may be found necessary to use a long-shanked bit and brace or augur and collect the shavings for the sample. Samples should be taken from at least three widely separated parts of the can and then mixed to form a composite sample. The butter sampler or bit should be thoroughly sterilized before use, either by dry sterilization or flaming in a Bunsen burner, either with or without previous dipping in alcohol. If it is necessary to take the sample with a spoon, the sample should be taken at least two inches below the surface and from at least three widely separated parts of the can.

No frozen egg samples should be examined bacteriologically that are not received in a frozen condition.

TRANSPORTATION OF SAMPLES.

All samples should be sent to the laboratories in the quickest possible way and examination should be made immediately on receipt of sample. Frozen egg samples, when transmitted by common carriers, should be so packed as to prevent thawing.

CONDITION OF SAMPLES.

Records should be kept of the general condition of all samples at the time of arrival at the laboratory, the appearance of the product, color, odor, etc.

TECHNICAL PROCEDURE.

The bacteriological examination shall be started as soon as possible after the receipt of the sample. All determinations for desiccated and frozen eggs shall be made on the gram basis.

In the case of frozen eggs, after the melting of the composite sample and before sub-sampling, it is advisable to mix the material thoroughly with a sterilized electric stirrer such as is commonly used at soda fountains to mix eggs, or, if such an instrument is not available, with a sterilized hand egg-beater.

BACTERIAL COUNTS.

Standard nutrient agar shall be employed and bacterial counts made at 37° C. after forty-eight (48) hours incubation and at 20° C. after ninety-six (96) hours. The committee also suggests for trial and criticism the use of litmus-dextrose-agar at 37° C. for forty-eight (48) hours. The determination of acid and alkali producing organisms is often invaluable in the interpretation of results. The procedure in plating and counting shall be made in accordance with the procedure as recommended in the Standard Methods of Water Analysis of the Association.

The following procedure is recommended:* Approximately five grams of the material shall be transferred to a tared sterile flask or bottle of about 100 cc. capacity and weighed to the nearest 0.01 gram. The weight of the material multiplied by nine gives the amount of sterile physiological salt solution to add to make a 1 to 10 dilution of the material. Thus, if the material weighed 5.1 grams, one should add 45.9 cc. of sterile salt solution to make a 1 to 10 dilution (5.1 x 9=45.9). From this point on the dilutions shall be made in the regular manner by transferring one cc. of the mixture to 9 cc. or 99 cc. dilution bottles of physiological salt solution. It will be found advisable to add glass beads or broken glass to the 1 to 10 dilution before shaking; this will help materially in getting a thorough mixture.

In the case of desiccated eggs, it is recommended to allow the mixture of egg and salt solution to stand for several minutes before shaking, in order to prevent particles of undissolved egg from sticking to the sides of the flask.

The following alternate method is suggested for trial and criticism: In a tared sterile flask of about 200 cc. capacity weigh out approximately one gram of the material to the nearest hundredth of a gram and dilute with 99 times this weight of sterile physiological salt solution. At intervals shake thoroughly until solution is complete and proceed with the subsequent dilutions and platings as recommended in the previous method.

DETERMINATION OF BACTERIA OF THE B. COLI GROUP.

The quantitative determination of the presence of members of the B. coli group shall be in accordance with the current procedure recommended by the Committee on Standard Methods of Water Analysis.

W. R. PINNELL,
H. W. CONN,
LESTER A. ROUND,
CARLETON BATES, *Chairman,*
Committee Bacterial Methods for Miscellaneous Food.

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*The use of 2 per cent. salt solution has been suggested for this initial dilution to facilitate the rapid solution of the egg protein. While the use of salt solution hastens the solution of many proteins, the committee is not in position at present to recommend any particular strength solution for this purpose. Criticisms and suggestions concerning this point are requested.

THE DIAGNOSIS OF SYPHILIS FROM SPECIMENS SENT TO THE LABORATORY.

DR. ADOLPH GEHRMANN,
Bacteriologist to Columbus Laboratories, Chicago, Illinois.

THE addition of syphilis diagnosis has greatly increased the work of all diagnostic laboratories, especially because the Wassermann test has been so extensively advertised. It may seem a simple matter to send a specimen to a laboratory and receive a prompt certain diagnosis in return, but we have found considerable difficulty with the specimens from a distance. I have reached the conclusion, that if we can get a piece of tissue from the initial sore or the suspicious lesion excised for direct examination or the serum collected as will be described, we can be assured of the most reliable results.

The only method that has proved efficient in our hands for determining the presence of spirochæte in preserved specimens is by the staining of tissue for their presence by the Levaditi method. We are making a considerable number of diagnoses in this way but it is not generally known that it can be done. There is also some disadvantage in that patients do not readily submit to cutting out a piece from the sore for examination. However, the tissue examination is extremely certain on early lesions and at the same time, it can be made quick enough to save the patient from an extended infection. The tissue specimen must be immediately preserved by 2 per cent. formalin solution.

In regard to serological work on blood that has been sent a distance, we have always held that we could not promise as close a reading of the Wassermann test as when we obtained the blood in the laboratory.

We have been in such uncertainty as to the outcome of tests that at one time we notified the doctors that if the test did not seem to conform to the clinical condition we would repeat the test if the patient would present himself at the laboratory. This, of course, is possible in some cases but not in all and then it may just be of utmost importance to have an immediate diagnosis established. There is no doubt but that some discredit has been put on the Wassermann test because of the simple failure in this one particular, that is to depend upon results made on unsatisfactory blood specimens.

We all desire to make this diagnosis efficient but should not go beyond reasonable certainty in promising results that may mean an entire change in the social relations and great expense to the patient or, on the other hand, a false security that may be dangerous to him and to his friends. From the fact that claims of great accuracy in Wassermann diagnosis have been so widely advertised, not alone physicians, but patients as well think that any kind of blood specimen sent to any laboratory will return a certain diagnosis. It is this state of affairs that has led me to look for some way by which we can get a reasonably clear and white serum for test instead of the usual muddy mixed blood that is sent to the laboratory.

The first requisite in serologic work is to have the serum for the tests in a perfect condition. Even when one has had some experience in taking these specimens it is not always a certain or easy thing to get a good specimen from every case.

The reasons for the unsatisfactory condition of sent in blood is due to:

1. Not enough specimen.
2. When it is lake colored.
3. Disturbance of the complement.
4. Contamination.
5. Possible small amounts of preservatives.

The outfit that we are using for collecting blood for Wassermann is the simplest possible bottle and a needle; with directions so that the doctor simply cleans the arm and puts on a constrictor and allows the blood to run into the bottle, and sends it as it is. This is our ordinary collecting outfit. The different devices for use in obtaining blood for test include syringe, vacuum bulbs or needles. Every extra manipulation or shaking of the blood quantity causes it to lake, and the only way to get clear serum is to allow a blood quantity to clot and expel the serum in as quiet a position as possible. The serum should then be drawn from the clot in the most gentle manner without in any way agitating the clot itself. If the blood can be drawn directly into centrifuge tubes and swung at once the clearest serum can be obtained, but to do this in the right way seems impossible for the average practitioner. We have tried many devices and changed our instruction and outfits repeatedly, but must conclude as stated above that simplicity gives the only chance for any fairly good and uniform results.

The outfit herewith presented makes it possible for the doctor to collect the blood and separate the serum partially in one operation and without centrifuge. Of course, there are some complications but they are slight compared to the advantage of a clear serum for our tests. The essential feature is a test tube with side arm and one cork. The side arm of the tube may be broken off and placed in the centrifuge when the outfit reaches the laboratory. It is best not to have the doctor break it off but to instruct him to send the entire tube with both serum and clot. It is then possible to see and use either or both parts of the blood for examinations.

INSTRUCTIONS FOR COLLECTING BLOOD FOR WASSERMANN TEST.

Have the following at hand ready for use:
Soap and water and 1: 1000 bichloride.
Alcohol and collodion.
Absorbent cotton.
A constrictor for the arm.
The outfit that we have sent.
Directions:
Clean up the arm over the median vein.
Put on the constrictor so that the vein shows.

Take the needle and the tube from the outfit and hold with the side arm up so that the blood will flow into the tube slanting.

Insert the needle and then let the blood run into the tube. *Now take off constrictor.*

Take out the needle and press cotton over the wound.

The tube with the blood should be placed in a slanting position with the cork inserted and the side arm *up*. When the tube shows serum over the clot then tilt it so that the serum runs into the side arm. Then push the cork in tight and pack it and send with directions to us.

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A Man and His Arteries.—Writing in *The Nurse* for August, 1917, Dr. William Brady says that "old age is curable—if taken in time." The degenerative diseases of middle age are considered, particularly the A B C of middle age, namely, apoplexy, Bright's disease and cardiac degeneration.

The one attribute which distinguishes youth from old age is elasticity. Old tissues generally are more fragile and less elastic than young tissues. As the individual grows older, the arteries begin to harden. As the degeneration processes develop, more and more calcium or lime is deposited in the various coats of the arterial wall, and the artery continually diminishes its elasticity. The deposition of the lime eventually narrows the caliber of the arteries, giving rise to a high blood pressure.

The causes of arteriosclerosis may all be summed up in one word—toxemia. Drinking water which contains much lime, or eating foods which are rich in lime salts, have no causal relation in hardening of the arteries. Rather it is the use of animal nitrogenous foods, leading to putrefaction in the colon, the use of alcohol, and overeating which are important factors in arterial hardening. Syphilis, lead poisoning, and in some cases, the toxins of typhoid fever, influenza and other infectious diseases play a part in the production of arterio-sclerosis. The excessive use of tobacco is also supposed to be a factor.

The prevention of arteriosclerosis in middle life depends on the life and habits of the individual in his early life. A clean, normal living, recreation and exercise in the open air, a diet that limits animal protein and uses vegetables, and satisfactory bowel action will postpone old age in middle life.

Book Reviews.

Hygiene and Public Health. *Parkes and Kenwood. Sixth Edition with illustrations. Philadelphia: P. Blakiston's Son & Co., 1917. Pp. xi+787. Cloth, $4.00.*

This is decidedly an English book and is "printed in England." Both authors are Fellows of the Royal Sanitary Institute and are well known hygiene teachers. There are fifteen chapters and 706 pages. Including the comprehensive index there are 775 pages. The book is well printed on good paper and well bound. The 89 illustrations are clear cut and well selected.

Chapter I. *Water*, for an abridged treatise, satisfactorily disposes of the subject. A correction seems necessary where the statement is made that "steam boilers should be of wrought iron." All boilers are made of steel these days. The wrought iron boiler days have long since departed.

Chapter II deals with "*The Collection, Removal and Disposal of Excretal and other Refuse.*" This chapter is well written, but the reader who knows of the Kentucky privy and the chemical closet is pretty sure to think that had these been described and opinions given, the treatment of the subject would have been more complete.

The recent important studies of air and ventilation, which show that temperature and motion are of greatest importance, are not mentioned. The "allowable percentage" of CO_2 is rather extendedly discussed, and the authors seem from their text to fear draughts.

The Contagia is the title of Chapter IX. The divisions of this chapter are *The Contagia*, 344 pages; *Communicable Disease*, 134 pages, and *The Investigation of Disease Outbreaks, Modern Views on Isolation and Disinfection, Carriers of Disease, Isolation of the Infectious Sick and Hospitals*, are the remaining divisions. It is a plainly written chapter, without insistence upon what Hill calls "The New Public Health."

Disinfection is treated in the usual way as if it were a serious matter and without reference to Chapin and his views.

Six editions surely means popularity for a book and those who become owners of this one will not be dissatisfied.

J. N. Hurty.

The Four Epochs of Woman's Life. *By Anna M. Galbraith, M. D., Third Edition. The W. B. Saunders Company, Philadelphia, 1917. Pp. 296.*

Previous editions of this book have met with large success. Its wide circulation has been well deserved for it is exceedingly well planned, inclusive yet compact, and temperate in statement. The four epochs dealt with are, in alliterative sequence, maidenhood, marriage, maternity, and menopause. The most individual treatment is that given to marriage. It is desirable that this chapter be read by many men. The woman's point of view is seldom indicated with such candor and clearness.

The inequality of physical passion in the sexes is a fact which needs the fullest recognition. It imposes upon the rightminded husband obligations of forbearance and self-control. But the ideal of "intercourse for procreation only" is a standard of extreme austerity. It is hard to believe that those are the happiest married lives in which it obtains. Granting that the animal is over strong in man we may still condemn the abhorrence of the physical which artificial culture often fosters in women. "Companionship on a high plane" is to be commended but it is inferior to companionship on *all* planes. The psychoanalysts have shown us what grievous harm comes from repression in every realm of human life. This is not said without cordial endorsement of Doctor Galbraith's main plea for restraint and consideration on the part of the husband.

The book is non-committal on the subject of birth control as ordinarily understood. It strongly favors birth restriction by continence. The general hygienic teaching is excellent. It seems questionable whether the introduction of speculations concerning telegony and sex determination is wise. The layman is prone to give too ready credence to mere personal notions about these obscure matters.

Percy G. Stiles.

Water Purification. *Joseph W. Ellms. First Edition. McGraw-Hill Book Co., Inc., New York and London, 1917. Pp. 445; Ills. in text, 148. Price, $5.00 net.*

An up-to-date treatise on water purification, especially one suited to the requirements of the student and the non-engineering reader as well as of the engineer, has been needed for some years past. Ellms' book meets these specifications perfectly. The author is not only a waterworks engineer of long and varied experience, but he has also been in close and sympathetic touch with the associated problems of chemistry, bacteriology, and epidemiology. He writes, therefore, with authority, and with a personal interest, which the reader cannot fail to sense, of those broader phases of water purification, which make this subject one of so great and so varied interest to sanitarians in general.

But with this breadth of treatment there is coupled, to an unusual degree for a work of this kind, an attention to detail which only the man on the works can give.

This book is unusually free of accidental errors, for a first edition, although the "balanced adenoids," figured on page 250, ought to be removed before the next edition.

The reviewer cannot agree that "chlorine or the hypochlorites are, therefore, merely agents for the production of oxygen under conditions which render it extremely active" (page 372), although this view is commonly held. There is ample evidence of a specified toxic effect of hypochlorous acid which makes it much more strongly germicidal than other agents of equal or greater oxidizing powers.

The book will prove of great value to public health officials and sanitarians, who desire to obtain a broad and general view of the problem of water supply. To the teacher, it affords an excellently arranged text, while the engineer, desiring concrete information on the details of construction or the theories underlying the processes of water treatment, will find it exceedingly serviceable.

Earle B. Phelps, Washington, D. C.

Women as Munition Makers—A Study of Conditions in Bridgeport, Connecticut, *by Amy Hewes, and* **Munition Workers in England and France,** *by Henriette R. Walter, New York. The Russell Sage Foundation, 1917. 8°. Pp. VII, 158. One map, 15 tables. Cloth, 75 cents net.*

The first two thirds of this little book comprises the summary of findings of Prof. Amy Hewes in an analysis of the social conditions of 165 women workers employed in the Remington Arms-Union Metallic Cartridge Company of Bridgeport, Conn. A special inquiry form was used and, from this, fifteen tables made up, showing among other things the last occupation before entering the munition industry, nativity, age, conjugal condition, occupation, daily and weekly hours of labor, lunch period, earnings, family incomes, rents and persons per room for each woman worker so studied. Permission was not obtained to carry the study within the plant. Investigation was made, for the most part, among women who had been residents of Bridgeport for at least two years prior to 1916, but considerably more than one half of them had had no previous factory experience. The one single product manufactured was cartridges. Severe accidents were not frequent, although occupational diseases appeared fairly numerous, particularly those affecting the skin. From a beginning of long hours of work as a customary procedure, Bridgeport gradually evolved into almost a model eight-hour-day city. Introduction of the three-shift system did most to bring this about. Wages were so high in the munition plant as to attract workers from other industries, although the analysis showed that there was no abnormally high rate of pay. The exact median earnings were $10.97, compared to a median of from $7.43 to $9.57 in the period just preceding the war in various industries in the city. As elsewhere, prices for commodities gradually rose and those who could not work were rendered more destitute than before, resulting in a rush to charitable institutions. Houses and living quarters became very scarce, rents mounted by leaps, the median increase being 22 per cent. The houses built by the company provided for only a fraction of those needing living quarters. Finally the city awakened to the situation and voted a sum of $2,275,000 for public improvements, while a house building company was organized and planned houses to accommodate 1,000 families. Experts were secured in each field of endeavor and by mutual coöperation and a strong sense of civic pride most of the uneconomical situations were surmounted, although the writer laments that industrial conditions, night work for women and sufficient protection against accidents and industrial diseases, including proper compensation, are still inadequate.

Pages 97 to 102 give a very instructive historical résumé of the progress of industrial conditions in England from the beginning of the war to February, 1917.

These surveys are excellent guides both to industrial managers and to war-boom centers. Observance of their precepts should save much time, money, waste, labor disputes and suffering throughout American industries.

Emery R. Hayhurst.

Public Health Notes.

Abstracts prepared by M. P. Horowitz, R. R. Harkness and A. W. Hedrich.

Hospitals Needed for Tuberculous Negroes.—Dr. Martin F. Sloan, writing in the *Southern Medical Journal* for August, 1917, describes the urgent need of hospital facilities for tuberculous negroes.

"One of the greatest health problems of the South, and one that is receiving very little organized and systematic attention, is the care of the tuberculous negro. It is highly commendable of the southern states that, as a result of the energetic anti-tuberculosis campaign that has been going on for the past decade, there are in this section, according to the 1916 Directory of the National Association for the Study and Prevention of Tuberculosis, 59 sanatoriums of a public or semi-public character with a capacity of 4,130 beds. There are 15 other sanatoriums in process of construction, and there are 22 private sanatoriums with a capacity of 757. Of the 4,130 beds, only 114 are for negroes. It is a reflection upon the farsightedness of the people that less than 3 per cent. of the public beds are allotted to a race that constitutes 29.8 per cent. of the population and one that succumbs to the disease in the proportion of about 3 to 1 white."

Increase in the Price of Culture Media.—Because of considerable increases in the cost of raw materials, the Laboratory of Hygiene finds it necessary to raise its present prices on culture media. After July 15 the prices of media regularly supplied will be as follows:

Loeffler's blood serum, per tube.......	$0.025
Plain nutrient agar, per tube.........	0.04
Plain agar, in cans, per 1,000 grams....	1.50
Nutrient broth, in cans, per 1,000 grams	1.25
Peptone bile,* in cans, per 1,000 grams..	1.50
Endo agar, in cans, per 1,000 grams....	1.50

A rebate of 1 cent a tube for Loeffler serum tubes and 1½ cents for agar tubes will be allowed for such tubes as are returned to the laboratory clean and in good condition.

In accordance with the provisions of Chapter 13, Session Laws of 1914, the Laboratory of Hygiene is authorized to prepare and sell culture media to municipal laboratories, physicians, druggists, and other persons who may have need for such supplies.—*New Jersey Public Health News.*

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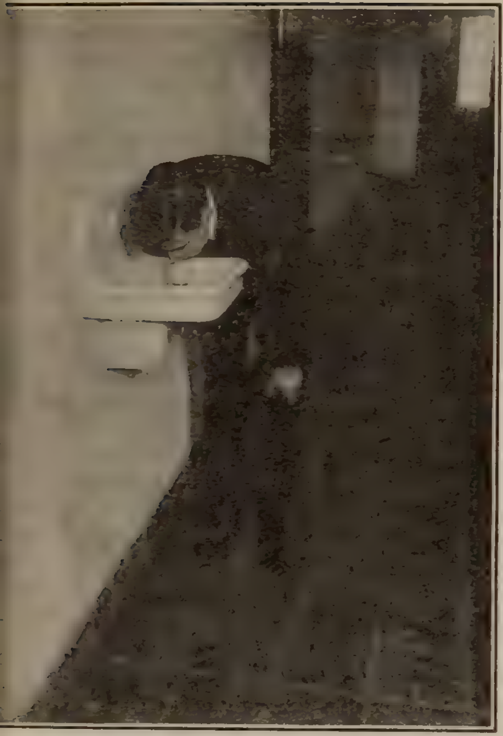
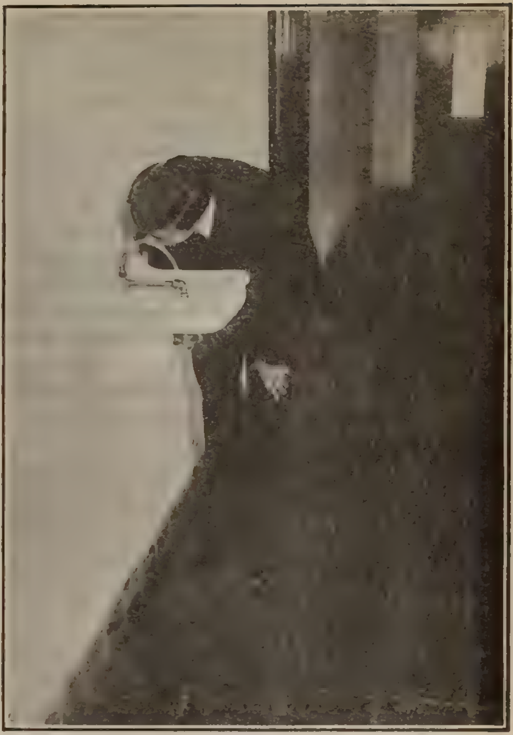
* This does not contain lactose—1 per cent. lactose should be added before tubing.



The Old Way



The New Way

Slanting Set on Drinking Fountains.—In the June, 1917, number of the Journal, we published a review of the article of H. A. Whittaker on Infection of Drinking Fountains, which appeared in Public Health Reports for May 11, 1917. Whittaker recommended a fountain with protected nozzle and a slanting jet. By courtesy of the U. S. Public Health Service, we are permitted to show illustrations of the old and the new types of fountain.

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Bile Outfits for Blood Cultures.—The Department of Health of Baltimore reports that the use of these will be discontinued as their use has proved unsatisfactory.

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Revaccination against Typhoid Fever and Asiatic Cholera.—Santoliquido (*Office international d'hygiene publique,* April 1917) points out that, in the present state of our knowledge, immunity induced by vaccines against bacteria cannot be held to last over a year. In general, protective inoculation should be repeated at yearly intervals, but since there is apparently a sharp decrease in the degree of immunity in the second six months after vaccination, protection should not be held adequate beyond six months among subjects exposed to special risks of infection. Even at the end of a year, however, there remains a distinct resistance to toxic products, and careful inquiry among the Italian troops showed that the local and general reaction after revaccination is much less marked and lasting than after the first vaccination. Most of the soldiers revaccinated were able to stay on duty, and in the 10 per cent. of cases exhibiting a more marked reaction, the latter consisted merely of transitory fever not exceeding 38° C. with a little headache and lassitude. Since the first two prophylactic injections in the initial series of three antityphoid inoculations are intended simply to prepare the organism for the third more powerfully protective injection, the first two injections in the revaccination may be omitted. In the same way, the first of the two anticholera injections may be left out. The single dose given should be somewhat larger than the third dose of the initial series, especially in the case of anticholera revaccination. The proper season for revaccination is winter in the case of typhoid and paratyphoid fevers and spring in the case of cholera.—From the *New York Medical Journal* for August 4, 1917.

⁂

Saving Mothers.—A full discussion of the causes and prevention of maternal deaths and an analysis of available statistics, are contained in a report on maternity mortality, recently published by the Children's Bureau, Washington, D. C.

"More women 15 to 45 years of age die from conditions connected with childbirth than from any disease except tuberculosis. About 15,000 deaths from maternal causes occur annually in the United States, and the available figures for this country show no decrease in the maternal death-rate since 1900. Maternal deaths are largely preventable by proper care and skilled attendance.

"These 15,000 deaths do not measure the full extent of the waste. They are merely a rough index of unmeasured preventable illness and suffering among mothers. Furthermore, certain diseases of early infancy are closely connected with the health of the baby's mother and the maternity care she has received, and these diseases cause about one third of all the deaths occurring among babies under one year of age. More than 75,000 babies die each year from this group of diseases because they do not have a fair start in life.

"A more general use of existing provisions for scientific maternity care, and the extension of provisions for such care in all types of communities, should serve to reduce the number of deaths among mothers and babies, and to improve the health and general condition of children throughout the country."

Whooping-Cough Is Lessened by Vaccination.—In the *New York State Journal of Medicine* for September, 1917, Dr. G. W. Golen, health officer of Rochester, N. Y., describes his success in preventing whooping-cough by vaccination. Over 10,000 children were vaccinated against the disease, and of these less than 5 per cent. came down with the disease. The treatment consisted of three inoculations of pertussis vaccine, four days apart. The amounts used were 500 million, one billion and two billion units.

It was also noted that if the disease breaks out after vaccination that it is milder in character.

It is planned to vaccinate as many infants as possible.

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Red Cross Sanitary Units Formed to Protect Soldiers.—The *Official Bulletin* for October 9, 1917, announces that three more Red Cross Sanitary Units have been formed and have been assigned to Greenville, S. C., Macon, Ga., and Manhattan, Kans. The units will coöperate with the United States Public Health Service and the state and local health authorities in establishing full and efficient health organizations for the inspection of milk and water supplies, the control of infectious diseases, the eradication of malaria-bearing mosquitoes near camps, and the general sanitary inspection of the community.

⁂

Infant Welfare Work in War Time.—In the *American Journal of Diseases of Children* for August, 1917, Dr. Grace L. Meigs sounds a warning against reducing our efforts to protect infants and pregnant mothers. At no time is the need for infant welfare work so keen as during the war period. The belligerent nations abroad —Great Britain, France, Belgium, Germany,— have all realized the importance of saving infants and protecting mothers, and have greatly increased their facilities for this work. Measures have been taken to protect the mother who is industrially employed, and to increase the number of infant welfare nurses; midwives have been carefully supervised, and free prenatal care and even confinement care have been provided.

And so, no diminution in the efforts to further the welfare of infants and mothers should be permitted in this country. In fact the work should be extended as much as possible. There is great danger, however, that the organization which has been built up for the protection of infant life will be partly disrupted through the loss of physicians and trained nurses, who are entering the service of the country, in connection with the war.

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To Officers of the Medical Reserve Corps U. S. Army, Inactive List.—Word received from the surgeon-general of the U. S. Army conveys the information to officers of the Medical Reserve Corps of the United States Army, inactive list, that assignment to active duty may be delayed, and that they are advised to continue their civilian activities, pending receipt of orders. They will be given at least fifteen days' notice when services are required.

✤

"Medical Review" Absorbs "Pediatrics."—Pediatrics will no longer appear as a separate publication, but has been incorporated into the *Medical Review of Reviews.* Beginning with January, however, the *Medical Review of Reviews* will contain a special department devoted to pediatrics. This feature is but one of the improvements scheduled for the coming year. Important symposia are now in progress; the editor will contribute a second series of pathfinders in medicine, a staff of associate editors is being formed, and thus the *Medical Review of Reviews*, in entering upon its twenty-fourth annual volume, promises to be more serviceable to the medical profession than ever before.

✤

The United States Food Administration announces the creation of an Advisory Committee on Alimentation, the purpose of which is to gain the active coöperation of experts in the determination of policies of food control from the standpoint of the science of nutrition. The committee consists of C. L. Alsberg, Russell H. Chittenden, C. F. Langworthy, Graham Lusk, LaFayette B. Mendel and E. V. McCollum.

✤

The Influence of Barn Factors on the Germ Content of Milk.—In the *Creamery and Milk Plant Monthly* for September, 1917, there appears an extract from *Bulletin 109* of the University of Illinois Agricultural Experiment Station. The article deals with the work of M. J. Purcha and H. M. Weeter on the influence of barn conditions on the bacterial content of milk. Three barns were studied. One was very clean, one very dirty and the third was fairly clean. The utensils used were, however, thoroughly cleaned and sterilized in each case, just before milking. The investigators found that although the bacterial content of the milk produced in the worst barn was higher than that produced in the other barns, yet by the simple precaution of sterilizing the utensils, the bacterial count could be kept below 10,000 per cc. in each case. It is, therefore, concluded that the barn itself exerts little measureable influence on the germ content of milk.

✤

Hookworm Disease and the War.—Dr. C. W. Stiles calls attention to the important question of hookworm disease among soldiers and new recruits in *Public Health Reports* for August 17, 1917. Of 75 militia recruits examined at a Government reservation, Dr. Stiles found 47 with hookworm infection, 3 with Ascaris lumbricoides, 1 Hymenolepis nana, and 1 Strongyloides. Only 25 examinations were negative. The writer points out, that malingering and poor physical condition may be due in some cases to hookworm infection. The danger of an epidemic of hookworm in the trenches in Europe, if preventive measures are not taken, is also mentioned. There is also danger that the infection may become widespread in France and Belgium, necessitating large expenditures of money to eradicate the disease after the war. It is recommended that all the recruits from those states where the disease is prevalent should be examined for intestinal parasites and either treated in the American training camps or discharged.

✤

The Richmond (Va.) School of Social Economy, on October 1, began giving courses in public health and public health nursing.

✤

The School of Public Health of Johns Hopkins University will not open for candidates for a degree in hygiene until the fall of 1918.

✤

The New Haven (Conn.) Visiting Nurse Association offers a course in public health nursing, beginning November 1.

Health of School Children.—According to the *Medical Officer* for September 8, 1917, the mother, whose child is entering school for the first time, is sent a circular letter, informing her of certain essentials for the health of the child. This is the practice in Derbyshire, England. The letter considers such questions as adequate sleep and fresh air, the hygiene of the teeth, the use of handkerchiefs, mouth breathing, breathing exercise, the care of the eyes and the use of spectacles, pediculosis, adequate and proper clothing, the weight and height of children, and avoidance of constipation. The letter also recommends certain foods for breakfast, dinner and supper.

*

Suicide Mortality among Wage-earners in the United States.—The Metropolitan Life Insurance Company recently completed a study of suicide as a cause of death among its industrial policyholders. The study shows that during the past few years there has been a tendency for the death-rate from suicide to decrease markedly. Cases representing over 4,000,000 white males, and about 5,000,000 white females were examined. For the white males, the rate in 1916 was 15.3 per 100,000 and in 1915, 19.6 per 100,000. Among the white females the rate in 1916 was 6.3 per 100,000 and in 1915, 7.5 per 100,000. Thirty-one per cent. of the male suicides occurred by firearms, and about 35 per cent. of the female suicides occurred due to poisoning.

The negroes showed lower suicide rates than the white persons, the negro males at the same time showing a higher rate than the negro females.

It is demonstrated that suicide is more than twice as frequent a cause of death among males than among females. This is true at all periods of life except at the ages 15 to 19. The white male suicide rate increases with each age period, the rate being highest at the ages 65 to 74 when it is over 80 per 100,000.

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Little Pure Zinc Oxide on the Market.—The Bureau of Chemistry of the U. S. Department of Agriculture has recently demonstrated that very little zinc oxide in the market complies with the standards of the U. S. Pharmacopœia. Nearly all the samples examined contained an excessive amount of lead.

Horse Flesh as Food.—The *Bulletin* of the Detroit Board of Health for June, 1917, states that several applications for licenses to slaughter horses and sell horse meat have been received in that city and regulations have been formulated under which such licenses will be granted.

"In addition to the usual restrictions governing the location and sanitary condition of all slaughter houses, the special rules governing the slaughtering of horses and sale of horse meat provide: That all horse meat sold in Detroit must come from horses slaughtered here and that all such horses must be inspected alive by a veterinary inspector of the Health Department; that the slaughtering must be done under the direct supervision of an inspector; that a thorough post-mortem inspection must be made of all organs for traces of disease and that the Mallein test for glanders must be made in the Board of Health laboratory, also that all horse meat shall be sold in shops that sell no other meat product and that such places shall be prominently placarded as horse meat shops. As the veterinary inspectors have been instructed to condemn and prohibit the killing of worn out and degenerated or diseased animals it is very doubtful if, under these restrictions, any horse meat will be offered for sale in Detroit until there is a much greater necessity and demand for it than exists today."

There is no reason why horse meat should not be as nourishing and as valuable an article of food as many other forms of meat now used; and there can be no valid reason why it should not be sold, provided that people using it know what they are buying and desire to use horse meat.

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Mortality Chart of Infancy and Old Age.—The Registrar of Vital Statistics for Rochester, N. Y., has compiled a chart showing the reduction in infant mortality and the prolongation of life from 1884 to 1916. In 1884 only 11 per cent. of all the persons who died in Rochester lived beyond 70 years, whereas in 1916, 24 per cent. reached the age of 70 before death. Likewise in 1884, 378 infants per every 100,000 people died, as against only 229 infant deaths per 100,000 population in 1916. During the same period the number of deaths from 1 to 5 years diminished from 192 per 100,000 people to 80, a decrease of 57 per cent.

Relation of Infant Mortality to Subsequent Mortality.—In the *Medical Officer* for August 4, 1917, the question is raised whether the saving of infant lives leads only to an increase in the number of unfit and a heavier mortality in subsequent life. Karl Pearson maintains that it does. Dr. John Brownlee, Director of Statistics for the Medical Research Committee, is inclined to take a different viewpoint. It has been found that a child brought up in the slums till past the age of seven and then boarded out, does not maintain the same health as a child of three taken from the same environment. Dr. Brownlee believes that the improvement of the environment is the most important factor for the maintenance of a healthy race and suggests that the improvement of housing and provision of open spaces should be the main line of action.

Public Health Clippings.

Prepared by R. R. Harkness.

Paul Revere, First President, Boston Board of Health.—Interesting light is thrown upon the sanitary conditions in Boston 115 years ago, the rules of the Board of Health, its work and expenses by the report and rules of the board published in the *Massachusetts Mercury*, a Boston newspaper, in 1800.

All those who have studied the early history of Boston know that Paul Revere was a very prominent man in his day in this city and that he held many public offices, but it is not so generally known that he was also the first president of the Boston Board of Health.

The columns of the *Massachusetts Mercury* show that he was president of the Board of Health in 1799 and in 1800, and his annual report of the work and expenses of the board, published in the *Mercury* on March 18, 1800, shows these facts:

"The salary of the secretary of the board was $550 per year; the wages paid the messenger and the inspector of the board totaled $370 a year for the two officials. The fines collected and paid over to the town treasurer amounted to $419, and the net expenses of the board for the year were $4,401.28.

In reporting on the work of the board for the year ending March 12, 1800, Paul Revere says the board had "cleaned 137 vaults running on the surface of the earth; 27 offensive drains cleaned; 61 yards cleaned of filth and offal; 36 heaps of refuse removed from the streets; 13 ponds and cellars cleared and filled; 16 parcels of bad fish removed; 6 foul docks cleared; 5 nuisances on wharves removed; 10 dead horses and cows carried into the channel and sunk; 2 lots of bad hides sent out of town; 8 parcels of bad provisions seized in the market and destroyed; 6 offal carts carried from May 1 to November 1, 6,478 loads of filth from various wards."

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Some Early Regulations.—10. "All graves for the interment of the dead shall be at least six feet deep, and the proprietors of the several churches within the town, under which dead bodies are or may be deposited, shall cause at least three bushels of lime to be slacked under each of them once every 14 days, from the first day of June until the first day of October, next following, each year.

"15. No feathers shall be landed within the limits of the town of Boston before the same have been examined by some person authorized for that purpose by the Board of Health and a Certificate obtained from him that in his opinion the said Feathers are free from infection and may be landed without danger to the Health of the inhabitants of the town; nor shall any Hawkers or Dealers in Feathers expose for Sale in the streets any Feathers before the same have been in like manner examined, and a similar Certificate obtained."—*Boston Globe.*

✠

Advice on the Use of Patent Medicines.—For weak lungs: Purchase a nice chamois-lined chest protector. Put it on your pet poodle dog, and take ten deep inspirations (breaths) slowly before an open window each morning. Retire to a warm bath room and take a cold sponge above the waist line. This do daily.

For constipation: Take three or four of Dr. Patent Medicine's Pink Pills. Roll each pill around the block, using your hand as propeller. Drink one pint of cold water before breakfast and at bedtime. Eat with regularity less meat and more vegetables. Wash your teeth with a toothbrush. Don't forget to thoroughly masticate your food.

For dyspepsia: Procure a box of Charcoal Dyspepsia Tablets. Put them in your flower pot. Charcoal is good for house plants. Go to your dentist and have your teeth cleaned and filled. Avoid anger. If fatigued, rest before eating. Select a good, wholesome diet, avoiding condiments and spices. Avoid midnight lunches, consisting principally of salads and coffee.—*North Carolina Health Bulletin.*

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Milton Said It.—

"If thou will observe
The rule of not too much, by temperance taught,
In what thou eat'st and drink'st, seeking thence
Due nourishment, not gluttonous delight,
Till many years over thy head return,
So may'st thou live, till, like ripe fruit thou drop
Into thy mother's lap, or be with ease
Gathered, not harshly plucked, for death mature.—Paradise Lost."

—*East Orange* (*N. J.*) *Health News.*

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Why a Birth Certificate?—

1. To establish identity.
2. To prove legitimacy.
3. To show when the child has the right to enter school.
4. To show when the child has the right to seek employment under the child labor law.
5. To establish the right to inheritance to property.
6. To establish liability to road and military duty, as well as exemption therefrom.
7. To establish the right to vote.
8. To qualify, to hold title to and to buy or sell real estate.
9. To establish the right to hold public office.
10. To prove the age at which the marriage contract may be entered into.
11. To comply with the law of the State of North Carolina.—*North Carolina State Bulletin.*

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If.—If birth registration had been adopted in Illinois thirty-five years ago, conscription of recruits would have been simpler and fairer both for the nation and the individual.

If the reporting of tuberculosis by physicians had been made obligatory in Illinois ten years ago, as it was in many states, the problem of protecting the American army from the invasion of tuberculosis which has crippled the warring nations of Europe, would be a far simpler matter.

If the golden rule were universally observed, police power would never have to be invoked in public health administration. If the adults of the nation absorbed as much knowledge of public health as school children, morbidity and mortality would rapidly decrease.—*Illinois Health News.*

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Notes and Nuggets.—Living for your country is just as patriotic as dying for it.

Every life saved from a preventable death is an added asset to your country.

The early detection and correction of a physical defect adds something to the efficiency of the individual.

There never was a time in the history of our race when Universal public health service was so badly needed nor when moral and physical stamina in individual and nation was so much in demand.—*North Dakota Health Bulletin.*

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Efficiency and Service.—The trend of the times is towards efficiency. Concerns of all kinds are spending large sums of money to weed out inefficiency and to obtain one hundred cents worth of service for every dollar expended.

Many health departments throughout the country, Cumberland included, are spending large sums of money each year for the inspection of plumbing. In Cumberland this amounts to about one thousand dollars yearly. The question naturally arises, "Is the City of Cumberland getting one thousand dollars worth of returns for the money spent?" In our mind there is no doubt that we are *not* spending this money where the returns are largest.

In our last annual report we stated that "we have long ago abandoned the idea that 'sewer air' and 'sewer gas' is the cause of disease, and it has many times been shown that such air contains a less number of pathogenic bacteria than the ordinary street air." We also advocated the transfer of plumbing inspection to the building inspection department if such a department existed. Since the publication of our report several other health officers have placed themselves on record for the same change, all feeling the same, that by the transfer, the work will be placed where it rightly belongs.

We are hoping that such laws as may be necessary will be passed in the near future, that will enable plumbing inspection to be carried on by a department that can obtain the largest amount of good.—*Cumberland Health Bulletin.*

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Are We Eating Intelligently?—There never was a time when it was more important to emphasize the fact that we should eat to live and not live to eat.

Probably our greatest economic error in the past has been our enormous consumption of meat. This can be materially reduced without any loss to our bodies if proper substitutes are chosen. For those who have passed forty there should not be one, but two, three, or even four, meatless days a week, or an equivalent reduction of rations. This would be a decided advantage in prolonging life as well as an economy of food.

A regrettable economic waste is in the use of the so-called food fads, particularly the patent breakfast foods. Many of these breakfast foods, pound for pound are costing us from ten to fifteen times as much as do the old-fashioned breakfast foods such as oatmeal, rolled oats, rolled wheat, corn meal.

Inasmuch as with many, food is the heaviest expenditure of the home, constituting as it does from one third to one half of the weekly wage, it is imperative that we give the choice of our food more serious consideration. If we choose our foods intelligently, have them cooked intelligently, and eat intelligently, we could not only develop a fitter race but incidentally effect an enormous saving in the national expenditure. —*Toronto Health Bulletin.*

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Health is Wealth.—

He spent his health to get his wealth
  And, then, with might and main,
He turned around and spent his wealth
  To get his health again.
—*Buffalo Sanitary Bulletin.*

Industrial Hygiene and Sanitation.

Abstracts prepared by Dr. Arthur Lederer.

Labor Legislation and Child-Welfare Laws Passed in 1916.—*Bulletin No. 213 of the U. S. Department of Labor, Bureau of Labor Statistics* reviews the labor legislation of 1916. *Bureau Publication No. 21* relates new provisions to those which they supplement or supersede and gives exact legal references for all material included. Laws affecting the welfare of children were passed during the year 1916 by each of the eleven state legislatures, holding a regular session, by the legislatures of the Philippine Islands and Puerto Rico, and by the Federal Congress.

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Indian Hill.—This is the name given to an industrial village which the Norton Company of Worcester, Mass., is building for its employees. This scheme represents one of the rare attempts in this country to create a clean, wholesome community for working people in which architectural beauty is one of the important considerations. Nobody will read the article of Charles C. May published by the National Housing Association of New York City without wishing that we had more such attempts of systematic town planning. Grosvenor Atterbury of New York is the architect. Indian Hill is a thirty-acre tract, several miles away from Worcester. The primary object of the project is to provide adequate housing for the employees of the Norton Company, with a view toward ownership, permanency and contentment in employment, and resultant general efficiency. The properties are sold to the workmen cheaply on an easy-payment basis.

A Successful Example of the Safety Movement.—Not a single passenger has been killed in a train accident on the Norfolk and Western Railway during the last five years, although in that period more than 34,000,000 persons have been transported.

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Occurrence and Mitigation of Injurious Dusts in Steel Works.—The U. S. Bureau of Mines, in its efforts to improve health conditions in mining and metallurgical industries, is investigating the effects of dusts in mines and metallurgical plants on those employed therein. *Technical Paper 153*, published by the Bureau of Mines, and prepared by J. A. Watkins, treats of the effects of industrial dusts in steel works. From the standpoint of the industrial hygienists, no health hazard to which those employed in modern industries are exposed is of greater importance than that of a dust-laden atmosphere. This fact has become so generally recognized that many life insurance companies refuse to accept as risks those engaged in the so-called dusty trades. The publication deals with the origin of the dusts, the methods of sampling dusty air, the general methods of mitigating the dust hazards and recommendations pertaining to the abatement of dust in the steel industries.

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Toxic Jaundice in Munition Works: A Review.—Toxic jaundice of industrial origin was up to the beginning of the present war practically always a form of arsenic poisoning caused usually by exposure to arseniureted hydrogen gas. A few cases of toxic jaundice had also been observed in Great Britain among workers in nitrobenzene factories. A few months after the outbreak of the war toxic jaundice appeared among the men employed in a large airplane works in England, and a few months later cases developed among workers in trinitrotoluol. The startling increase of this almost new industrial disease led to much careful study in England, the result of which appears in an article by Alice Hamilton in the August issue of the *Monthly Review of the U. S. Bureau of Labor Statistics*. For American authorities this information is of the greatest value, since the production and handling of the trinitrotoluol is increasing enormously in this country, and we have every reason to expect poisoning among the workers who handle it.

Certificates for Mine Rescue Training.—Training in the use of mine rescue apparatus was begun by the Government in 1908 as a necessary part of the work relating to the investigation of mine explosions. The Bureau of Mines, after its establishment in 1910, continued this training, and the work of its mine rescue stations and the course was extended to include instructions in first aid for the injured. On June 30, 1916, the total number of miners trained by the bureau since its organization was 42,045. *Technical Paper 167 of the Bureau of Mines*, compiled by D. J. Parker, contains the names of all the men to whom mine rescue certificates were issued during the period July 1, 1914, to June 30, 1916, with the place of residence or post office address. The paper is published with the intent of giving more effect to efforts to guard the lives of miners. The publication will enable state and mine officials to obtain with minimum delay the services of the trained men they are liable to need and will encourage more men to take the training and will help to maintain the interest and enthusiasm of those already trained.

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The Proceedings of the First Industrial Safety Congress of New York State have appeared in bulletin form. The congress was held in Syracuse, N. Y., December 11–14, 1916, and many papers of great interest by leading men connected with this movement were presented.

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The Industrial Commission of the State of New York has issued a bulletin containing the Workmen's Compensation Law of that state with amendments and additions to July, 1917. The Workmen's Compensation Law had been in effect three years on the first of July, 1917, administered by the Workmen's Compensation Commission during its first eleven months, and, since then by the State Industrial Commission.

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The Joint Board of Sanitary Control in the Cloak, Suit and Skirt and Dress and Waist Industries in New York City has published its Seventh Annual Report. Organized and established in 1910, after the great strike in the needle trades, this board is the first institution of its kind. The primary aim of the board was to establish standards of sanitary conditions to which the manufacturers and unions should be committed. The manufacturers and the unions obligated themselves to maintain such standards to the best of their ability and to the full extent of their power. The Joint Board of Sanitary Control is an experiment in industrial control. It legislates and sets standards. Seven years of work have proved that an industry is capable of taking care of itself. The improvements in safety, fire protection and sanitary conditions have been striking.

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Cost of Health Supervision in Industries.—An extremely valuable table has been compiled by M. W. Alexander of West Lynn, Mass., for the Conference Board of Physicians in Industrial Practice. The tabulation deals with the Cost of Health Supervision in Industry. It is the second compilation made. The first one was published in October, 1916. The present tabulation presents data for 1916 as reported by ninety-nine industrial plants, located in fifteen states. The total number of employees represented was 495,544; the average number per plant was 5,005; the maximum, 37,107; the minimum 141. The average cost of health supervision per person was $2.50 and, omitting four plants, which render unusual service, the average cost was $2.21. The aim of this compilation is to inform employers of the actual cost of health supervision of employees in different industries.

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The Proceedings of the Conference on Social Insurance, called by the International Association of Industrial Accident Boards and Commissions, Washington, D. C., December 5–9, 1916, appear in *Bulletin No. 212, U. S. Department of Labor, Bureau of Labor Statistics.*

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How France Returns Her Soldiers to Civilian Life.—This subject is embodied in a report to Surg.-Gen. G. C. Jones, director of Medical Services, Canadian Contingents, by John L. Todd, major. A short review of this important document can be found in the August issue of the *Monthly Review of the U. S. Bureau of Labor Statistics.*

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Medical, Hospital, and Surgical Treatment for Employees.—By Anice L. Whitney. A study of work for industrial betterment carried on by employers, covering a large section of the country and including many firms which are large employers of labor, was made recently by agents of the U. S. Bureau of Labor Statistics. Schedules were taken for 431 establishments, 375 of which, with a total of 1,204,010 employees, reported some provisions for giving medical treatment. Of these 375 establishments, 110 have first-aid equipment, 265 have hospital equipment, and 171 employ physicians. About 190 of the companies visited give free medical service in addition to accident service; 181 establishments employ trained nurses.—*Monthly Review of the U. S. Bureau of Labor Statistics,* September, 1917.

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Wholesale Prices in the United States, January to June, 1917.—The mounting cost of living in the United States is reflected in statistics of wholesale prices collected by the Bureau of Labor Statistics of the United States Department of Labor. For all commodities included in the bureau's investigation, aggregating 294 distinct articles, the increase for June over January was 23 per cent.

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Hoods for Removing Dust, Fumes and Gases.—A Special bulletin issued in May, 1917, under the direction of the New York Industrial Commission, gives the result of a careful study of various types of hoods for removing dust, fumes and gases, showing the inadequacy of certain kinds in use in some plants and describing hoods that are so constructed and adapted as to prove highly effective in accomplishing the purpose for which they are intended. It appears from the report that one of the most effective types of hood is that constructed with a double wall, with an allowance of one inch between the inner wall and the outer wall, at the edges of which there should be a minimum air velocity of not less than a thousand feet per minute and two hundred feet per minute over the central area of the hood.—*Monthly Review of the U. S. Bureau of Labor Statistics,* September, 1917.

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Vocational Education and Employment of the Handicapped with Special Reference to Crippled Soldiers.—An extensive bibliography on this subject may be found in the September issue of the *Monthly Review of the U. S. Bureau of Labor Statistics.*

Personal Notes.

Prof. Edward Bartow of the Illinois Water Survey Division has been commissioned a major in the Army Sanitary Corps to special work with the troops in France.

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Prof. Samuel C. Prescott of the Massachusetts Institute of Technology has accepted a majorship in the Army Sanitary Corps. At present he is giving instructions to army officers in food inspection.

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Dr. S. W. Welch has reorganized the Laboratory Staff of the Alabama State Board of Health. Dr. P. P. Salter has been appointed director and Mr. Edahl of Chicago first assistant.

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Mr. James A. Tobey, formerly health officer at West Orange, N. J., has resigned in order to become a chief sanitary inspector for the American Red Cross.

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Dr. D. C. Steelsmith, having recently completed a course at the Harvard-Technology School for Health Officers, has accepted the position of health officer for the City and County of Tuskaloosa, Ala.

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Dr. F. H. Wilmot has resigned as industrial physician to the Dennison Company at Framingham, Mass., in order to enter the War Medical Service.

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George T. Palmer, chief of investigating staff, New York State Commission on Ventilation, has been commissioned first lieutenant in the Sanitary Corps of the Army.

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Dr. R. C. Kirkwood, former superintendent of the Mt. View Sanitorium, Lakewood, Wash., has been appointed assistant chief of the Medical Service, U. S. Hospital for Tuberculosis, at Fort Bayard, New Mexico.

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Dr. F. G. Boudreau of Columbus, Ohio, has joined the Medical Reserve Corps for foreign service.

Dr. H. B. Roshon of Reading, Pa., has been commissioned lieutenant in the Veterinary Reserve Corps.

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The following have been elected to membership in the American Public Health Association:

H. V. Amerman, Kearny, N. J., Health Officer.

James Lindsay Andrews, M. D., Memphis, Tenn., Physician and Health Officer.

Frederick G. Barr, M. D., Dayton, Ohio, Physician.

Charles J. Bartlett, M. A., M. D., New Haven, Conn., Physician, Director of Laboratories, Connecticut State Board of Health.

Dr. Lela J. Beebe, Philadelphia, Pa., Physician, and at present student in Public Health.

John Hillman Bennett, M. D., Pawtucket, R. I., President, State Board of Health of Rhode Island; Superintendent of Health, Pawtucket, R. I.

Frank A. Blair, Chicago, Ill., Manufacturer.

Dr. Joseph Wilfrid Bonnier, Montreal, Can., Statistician of the Superior Board of Health of the Province of Quebec.

Charles H. Bower, M. D., Council Bluffs, Iowa.

Herbert E. Bowman, Ph. G., Somerville, Mass., Bacteriologist and Inspector of Milk and Vinegar, Somerville, Mass.

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ACUTE CONTAGIOUS DISEASE IN THE FRENCH ARMY.

SURGEON MAJOR E. RIST,
French Scientific Mission.

Read before the General Sessions of the American Public Health Association, October 19, 1917, at Washington, D. C.

CONCERNING the health situation in the French Army at war, there is one point which must always be kept in mind, namely, that the problems we had to deal with presented themselves under conditions entirely different from those of the British Army or of the United States Army. One must always remember the sudden onset of war on the French front, and what that sudden onset meant to us. Mobilization was ordered in France on Saturday, the 1st of August, at 4 p. m. It was to begin on Sunday, the 2d, at 1 a. m. That same Sunday Germany declared war. That same Sunday the German Army invaded Luxembourg and Belgium. On the 23d of August the battle of Mons-Charlerai was fought on the Franco-Belgian frontier. On the 3rd of September, one month after the beginning of the war, the German Army, having invaded the whole of northern France, was within 15 miles of Paris.

Mobilization, therefore, meant the gathering together, at a day's notice, of an army of about 3,000,000 men, in order to check that invasion. Out of those 3,000,000 men, less than 500,000 were in actual training, belonging to the yearly draft of young men serving for two years, under the law of conscription. The rest, more than 2½ millions, had been trained previously, but had long since returned to their peaceful, civilian occupations. Those mobilized men were not to be sent to training camps. They were to rush to the frontier at once, and to fight. There was not an hour to be lost. We could not dream of making a careful physical examination of all our men. Indeed we were hardly in a position to make any physical examination at all. Only those who reported sick were seen by the medical officers. And, believe me, there were not many, so eager were they to do their duty. Not a few concealed their ailments lest they should be prevented from going. The all important thing was to get our men together, to equip them, and to ship them over by rail to the particular spot which had been assigned to their unit on the mobilization scheme.

From a purely military point of view, this mobilization scheme was carried out with marvellous speed and accuracy. But you will easily understand that even such important measures as antityphoid vaccination had to be postponed in face of the actual threatening invasion by the German Army. We knew very well that we were running the risk of typhoid, and, as a matter of fact, we had a severe outbreak of typhoid in our army during the winter 1914–15. So had the Germans. We knew very well that we were running the risk of other contagious diseases such as diphtheria or cerebrospinal meningitis or dysentery, and that we were probably admitting into our ranks many men infected with open tuberculosis. But, however serious this danger, it was but a trifle compared with the much more formidable and immediate danger of France being conquered.

The world knows how this danger was averted by the victory of the Marne, early in September, 1914, how trench warfare began and has not ceased yet, and how we were able to breathe again, to take up the sanitary problems in our army, and to organize the prevention of disease.

Vaccination against typhoid was made compulsory by law, and, as rapidly as could be, applied to the whole army. It was no easy task, as you well may imagine, because any interference with the immediate military necessities had of course to be avoided. Bacteriological and chemical laboratories were established in every army corps. Carriers and contacts were detected and segregated. The water supply was carefully analyzed. Every suspicious drinking water was chlorinated. Provision was made for the removal and destruction of excreta, for disinfection of clothing. In short, an efficient and modern system of prevention was at first improvised as best as we could, and, later on, completed and perfected.

I think one can easily realize what our difficulties have been. We made a bad start, and, under the circumstances, it could not but be bad. But the difficulties have been overcome to a considerable extent, and the facts and figures which I shall now give justify the opinion that the French Sanitary Service has made a pretty good record after all.

During the whole course of the war, there have been only two cases of smallpox in our army, and not more than 50 in the civilian population. I reckon from the official figures published in the *Deutsche Medizinische Wochenschrift*, that, from November, 1915, to May, 1916, more than 27,000 cases of smallpox have been registered in the civilian population of Austria alone, not including Hungary and Bosnia Herzegovine.

During the whole year 1916 bacillary dysentery has caused a severe epidemic in Germany. From December, 1915, to October, 1916, the official figures are 691 deaths in the civilian population of Prussia alone (not including Bavaria, Saxony, Wurttemberg, and the other confederate states). The German medical weeklies do not give any figures concerning the army. But the numerous papers published by prominent German physicians, such as *His Matthes, Gottschlich, Kolle*, agree on the fact that the epidemic has been imported from the army into the civilian population, and that it was much more extended and severe in the army, the death-rate amounting to 10 and even 12 per 100. From January 1, 1915, to December 31, 1916, we have had only 193 deaths from dysentery in our army.

It is well known that typhus fever has caused many thousands of deaths in Germany and in Austria-Hungary. We have not had a single case of typhus in France, despite the fact that the disease is endemic among the native population of Morocco, whence troops have been constantly coming over to France.

Cholera has caused a severe epidemic in Turkey, where, in the short space of time—from May 14 to August 27, 1916,—13,836 cases and 7,159 deaths have been registered. Austria-Hungary has suffered from the epidemic also, and many cases have been officially recorded in Germany. The Serbian Army, during its heroic retreat through Albania, and after it had been landed in safety by French and Italian vessels on the Island of Corfou, was decimated by cholera. Although there has been a constant coming and going between French Mediterranean ports and Corfou, we have not had a single case of cholera in France.

Uncinariasis is endemic in the native population of French Indo-China. Many ten thousands of Indo-Chinese have been imported into France since the beginning of the war, to do work in the ammunition factories and in the hospitals. They have been so carefully selected, examined, and, when necessary, treated, that I don't know of any single case of uncinariasis having occurred in France.

The only tropical disease which has been imported into France so far, is amoebic dysentery. It had been overlooked at the beginning, when North African troops contaminated quite a number of men in some French units. Now the carriers are very carefully searched after, segregated and treated, and I have good reason to believe that there is no further extension of the disease.

We have had, of course, a considerable number of cases of malaria in soldiers returned from Saloniki; Macedonia, and the Vardas-Valley especially, is one of the most malaria infested places in the world. The fever is of the worst tropical type. Almost all of our cases have crescent shaped parasites in the blood. They are now all treated in special hospitals, located in such regions, where, after a careful entomological survey, it has been proved that there are no anopheline mosquitoes. No malarial hospital is allowed in a district where anophelines are present.

Now, as regards infectious communicable diseases. The monthly return of cases and deaths due to the following diseases: measles, scarlet fever, mumps, diphtheria, cerebrospinal meningitis, typhoid (including paratyphoid) and bacillary dysentery, on the front, show that there has been a constant falling down from very high figures at the beginning of the war to remarkably low figures at the present time. During the month of January, 1915, we had 16,505 cases and 2,268 deaths from acute contagious diseases. The figures for January, 1916, are 4,692 cases and 74 deaths, and for January, 1917, 1,990 cases and 41 deaths.

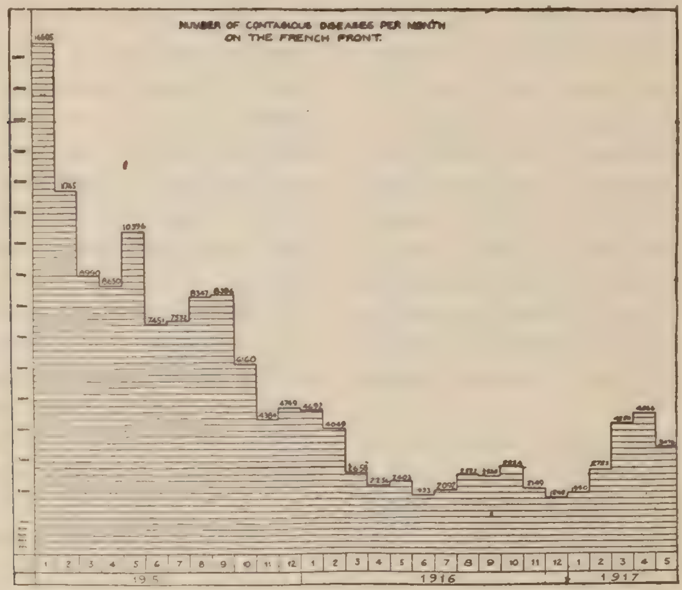

Fig. 1.

Outside the war zone, in our depots and training camps, we had from the same diseases in 1915, a sick rate of 70.05 per 1,000; a death-rate of 2.70 per 1,000; in 1916, a sick rate of 47.03 per 1,000; a death-rate of 1.05 per 1,000.

The last peace time army statistics which have been published are for the year 1911. They show us:

In 1911, a sick rate of 49.28 per 1,000; a death-rate of 0.87 per 1,000.

If we take the figures for the war zone in 1916, we get: War zone, 1916, sick rate of 12.80 per 1,000; death-rate 0.31 per 1,000.

The death and sick rates from acute contagious diseases are therefore lower on the front than they are in the interior, lower on the front than they were in peace times.

The decrease in sick and death-rate on the front from 16,505 and 2,269 in January, 1915, to 1,990 and 41 in January, 1917, is not so much due to the diminution of such diseases as measles, scarlet fever, diptheria or cerebrospinal meningitis,—notable as this was,—as to a considerable reduction of the typhoid cases. This requires some explanation. As I have said already, we were confronted, during the first winter of the war, with a very severe outbreak of typhoid. In

January, 1915, we had 13,993 cases with 2,210 deaths. The average number per month during the year 1915 was 5,587.7 cases with 493.6 deaths, a fatality-rate of 8.8 per 100. During the year 1916, the average number of cases per month was 1,040.1 with 41.7 deaths—a death-rate of 4.01 per cent. During the first five months of 1917, the average number of cases per month was 51, with 4.6 deaths—a death-rate of 8.2 per cent.

How is this to be accounted for?

When the war began, a small number of soldiers actually in training had been vaccinated against typhoid. The 2½ million men who were not in actual training when the war began had not been vaccinated. But by the end of 1915, more than 80 per cent. of our army had been vaccinated. At the same time, other prophylactic measures had been taken: the drinking water problem had been solved, the disposal of fecal matter had been provided for, the general sanitary condition of the trenches and cantonments had been much improved. Carriers had been searched for—at least in some instances—and isolated. The combined effect of those measures with vaccination was that considerable decrease of cases from 5,587.8 monthly to 1,040.1, or, to put it more strikingly, from 13,993 in January, 1915, to 323 in December, 1916.

But how can we explain the decrease of the average monthly death-rate from 8.8 per cent. in 1915 to 4.01 per cent. in 1916? The difference is

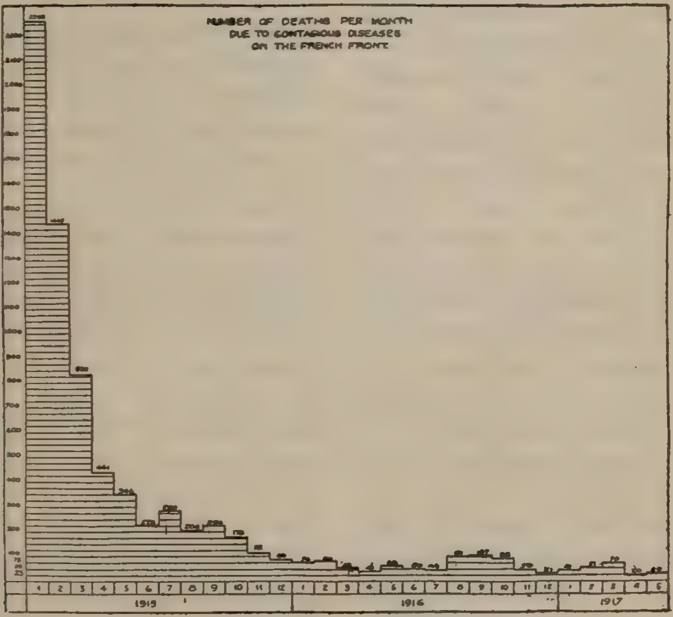

FIG. 2.

much greater still if we compare the death-rate of January, 1915, which was 15.8 per cent. with the death-rate of December, 1916, which was 2.8 per cent. It evidently cannot be due to some improvement in therapeutic methods, although there is no doubt that hospital equipment and nursing were ever so much better in 1916 than when the war began. It cannot be due solely to the fact that typhoid in a vaccinated individual runs as a rule a milder and more favorable course. As a matter of fact, my personal experience of 18 months typhoid work in a field hospital, is that, although vaccination diminishes the sick rate, it does not considerably diminish the death-rate. I even think that there is a certain type of rapidly fatal cases which is only observed in vaccinated patients and points to a certain degree of hypersensitiveness caused by previous vaccination.

The considerable decrease of the death-rate is really due to the fact that, up until July, 1916, we vaccinated against typhoid only, and that, by so doing, we caused a decrease in typhoid cases and a corresponding increase in paratyphoid cases. The abnormally high amount of paratyphoid has been observed by all the physicians on the French front who have been in a position to use blood-cultures as a routine method of diagnosis, and was considered very puzzling. A careful analytical study of all the cases which have been treated in my hospital has shown me the following facts:

Among 215 cases up to December 15, 1915, I had

56 typhoid	vaccinated	29
	non-vaccinated	27 = 48.2%
159 paratyphoid	vaccinated	139
	non-vaccinated	20 = 12.88%
Total 215 cases	vaccinated	168
	non-vaccinated	47 = 21.86%

During the same period, I had, coming from the same units, from the same trenches and cantonments, 621 cases of diseases which had no connection whatsoever with typhoid or paratyphoid (pneumonia, malaria, dysentery, rheumatic fever, tuberculosis, bronchitis, etc.). They can be divided as follows:

621 non-typhoid cases	vaccinated	485
	non-vaccinated	136 = 21.88%

It appears that, among those non-typhoid and non-paratyphoid cases, the percentage of non-vaccinated men (21.88 per cent.) was strikingly the same as among the typhoid and paratyphoid cases taken all together (21.86 per cent.). The figures 21.88 per cent. represent the percentage of non-vaccinated men in this particular section of the army. Let us suppose that we divide the men in the army into fair-haired and dark-haired men, and that we get a normal percentage of 21.88 per cent. dark haired. The color of the hair having no known connection with the susceptibility to typhoid, we must admit that, if there is an outbreak of typhoid among our men, the relative percentages of fair-haired and dark-haired will be the same among the typhoid cases than among the normal contingent. Now this is exactly what happens if we divide our men into vaccinated and non-vaccinated. And we are drawn to the conclusion that if we regard typhoid and paratyphoid as one and the same disease, vaccination against typhoid only has resulted in leaving unimpaired the sick rate, and in substituting a case of paratyphoid for every case of typhoid it averted.

The death-rate in paratyphoid being much lower than in typhoid, it is perfectly clear that our low death-rate of 1916 was due to the abnormally high proportion of paratyphoid among our typhoid cases.

In July, 1916, we began to vaccinate our army against the three germs: B. typhoid, B. paratyphoid A and B. paratyphoid B, using what is now known as a triple vaccine. By now this triple vaccination has been almost completed. The result has been a considerable decrease of the sick rate: 51 cases per month in 1917, as against 1,040 in 1916. But the death-rate has gone up again to its previous height, rising from 4 per cent. to 3.2 per cent. The increase in death-rate is the normal consequence of triple vaccination, which has restored the usual proportions of typhoid cases as against paratyphoid cases. This augmented death-rate is much more than compensated by the lower sick rate; 51 average monthly deaths in 1917 as against 493 in 1916.

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THE WORK OF THE UNITED STATES PUBLIC HEALTH SERVICE IN RELATION TO THE PRESENT WAR.

John W. Trask,
Assistant Surgeon General, United States Public Health Service, Washington, D. C.

An address delivered before the American Public Health Association, October 18, 1917, at Washington, D. C.

THE Public Health Service is protecting the health of the troops in mobilization camps and cantonments by securing the best possible sanitary conditions and health administration in the territory surrounding these camps.

It is increasing the facilities at its quarantine stations, particularly on the Atlantic seaboard, so that it will be able to meet any emergency which may arise in connection with returning troop ships with communicable diseases on board.

It has also in various ways, through its hospitals and quarantine stations and through the assignment of some of its officers to the army and navy, been able to be of service to the war and navy departments.

With regard to the work in the extra cantonment zones, in the vicinity of the army cantonments the population is in an unsettled condition. First there came to these areas thousands of workmen to erect the buildings. Later, with the advent of the troops, there have been coming other thousands, camp followers in a way, those who will engage in various kinds of business and cater to the needs and entertainment of the soldiers. The cities are increasing temporarily in population, towns are doubling and trebling in size, and new towns are coming into existence, almost overnight. The soldiers will mingle with the civilian populations in these areas, and the health hazards of the one will be and are the health hazards of the other.

Disease tends to spread, and health hazards consequently to increase, wherever people are brought together in large numbers. The greater the number of people, the greater the number of persons among them carrying the infection of communicable diseases. The greater the number of people brought together in a given area, the greater are the chances for infected persons to infect others and for disease to spread. This is particularly so where large numbers are brought together suddenly, where towns spring up, or where the populations of existing towns are greatly increased. In cities and population groups of gradual growth, measures of protection against health hazards are usually developed with the growth and needs of the population, but where there is a sudden and proportionally great increase there is brought together a population for which there is no adequate provision against the spread of disease. The principal agencies by which communicable diseases are spread are contact with infected persons, the use of infected milk and other food products, infected drinking water, and flies and mosquitoes. These agencies, uncontrolled or inadequately controlled, constitute health hazards which become an acute menace with the unsettled conditions accompanying a sudden increase in the number of people in a community.

From the standpoint of the federal government the troops must be protected from all unnecessary hazards, including the hazards of preventable disease, that their full and unimpaired strength may be preserved for their real work and because it is not intended that they shall be exposed to hazards that are useless and avoidable.

At the same time the sanitary and health hazard conditions being created in the civil areas surrounding mobilization camps are the necessary result of the country's present undertaking. They are not conditions for which the localities in which they occur are responsible. The communities in the extra cantonment zones compare favorably in their sanitary condition and provisions for the control of disease with similar communities elsewhere. The underlying facts are that the provisions for the control of disease in most communities are far from complete even under usual and normal conditions and that sudden increases in population in small cities and towns, such as are occurring in these areas, create acute problems.

In view of the necessities and responsibilities of the government, it has become the work of the United States Public Health Service to see that the sanitary conditions in the civil zones around mobilization camps are such as not to be a menace to the troops and that the provisions for the control of disease in these zones are adequate.

At first it looked as though the situation might offer peculiar difficulties. The obligation to protect the troops rested upon the federal government while the police powers in the civil zones around the military camps rested with the state authorities. The matter was quickly solved, however, in most instances by the state authorities who gave the Public Health Service officers technical appointments under the state and thus conferred upon them the civil police powers. This is but one of the many illustrations of the promptness with which the state health authorities have universally shown their eagerness to coöperate and to do whatever was possible to assist in the work.

On the part of the federal government, no special act of Congress was required to make the work possible, inasmuch as existing statutes provided amply for the prevention of the spread of disease from one state to another and for coöperation between the Public Health Service and state and local health authorities.

As soon as the locations of the cantonments for the national army and of the camps for the national guard had been decided upon, parties were started out to make sanitary surveys of the civil areas around the proposed camp sites. The first parties were sent out as early as last June. Their purpose was to ascertain as regards these areas the provisions for and the actual efficiency of local health administration, the condition of existing water supplies, with special reference to their purity or pollution, or possibility of pollution, the condition of the local milk supplies, the prevalence of communicable diseases and the extent to which the spread of these diseases was being prevented. Particular attention was given to the presence or absence of malaria and of conditions favoring the breeding of anopheline mosquitoes which spread the disease. After completing each survey a report was made of the measures necessary to remedy existing defects and to provide adequately for sanitary administration and the prevention and control of communicable diseases.

So far, officers of the Public Health Service have been placed in charge of sanitation and health administration in the civil zones around 20 mobilization camps. In most instances these officers, in addition to having been made officials of the respective state departments of health, have been vested with such powers as the local city and county authorities concerned can give. Thus these officers possess the unusual advantage of the combined authority of the federal government, the state government, and the local government.

Much of the work done in each civil zone will be of permanent benefit to the locality. In mobilizing the resources available for the work in each zone, therefore, consideration has been given, first to the existing resources of the various local governments, that is, city and county governments, and to the additional funds they are able to make available. Secondly, cognizance has been taken of the assistance which the state health departments could give. Then the Public Health Service has assumed, where necessary, much of the burden of sanitation in the rural territory outside of cities and of the measures necessary for malaria control and the elimination of mosquito breeding places. Finally, the Red Cross, through its recently created Bureau of Sanitary Service, renders most valuable aid by supplying, where needed, what are known as Red Cross Sanitary Units. These units consist of bacteriologists, sanitary inspectors, public health nurses, clerks, laboratory assistants, and miscellaneous employees. These units, by supplying a working personnel, have been an important factor in making it possible to get the work started in the various zones without delay. Through the mobilization and coördination, under an officer of the Public Health Service, of the authority and resources of the communities concerned and of the state and federal governments, supplemented by the assistance of the Red Cross, where needed, effective and coördinated sanitary control has been made possible.

In determining the civil areas which will be taken under sanitary control an effort is made to include all the territory which will be frequented to any considerable extent by the troops from the cantonment or camp. In most instances the zone is at least five miles wide, and, in addition, includes all cities connected with the camp by railroads or other transportation facilities in such a way that the soldiers will naturally be frequent visitors. In some instances the zone includes all of a county, in other instances as much as two counties, or parts of several counties. The zone, for instance, around Fort Oglethorpe, Ga., includes parts of Hamilton County, Tenn., Walker County, Ga., and Catoosa County, Ga. Included in this area, involving parts of two states and three counties, are nine municipalities, including the city of Chattanooga. The population of this civil area is approximately 100,000 at the present time.

During the preliminary survey of these extra cantonment areas the nature of the local health laws and regulations was studied. One of the first steps taken by the officer of the Public Health Service upon assuming charge of the sanitary administration has been to have adopted whatever additional health regulations and ordinances were necessary for proper sanitary control. In most instances it has been necessary to have adopted ordinances and regulations regarding such matters as the maintenance of surface wells, ordinances requiring property owners to connect with public sewers and water mains, and ordinances and regulations relating to the production, handling, care and sale of milk and other food products. When these ordinances are adopted, it becomes the duty of the Public Health Service officer and his staff to enforce them, as well as the requirements for the reporting of cases of communicable diseases and other existing laws and regulations relating to the public health. The enforcement is really the keynote to the situation. No matter how many laws a locality may have for the protection of the public health, and no matter how wisely and carefully these laws may have been drawn, the laws cannot enforce themselves, nor in any way improve sanitary conditions. It is the degree and manner of enforcement that counts, and little law thoroughly enforced will accomplish far more than much law unenforced.

The personnel of the local health departments is used as the nucleus of the sanitary staff, to which are added epidemiologists, sanitary engineers, bacteriologists, medical inspectors, public health nurses, sanitary inspectors, and such other employees as may be necessary. The state health department in many instances gives the service of one or more of its experts. The Public Health Service puts in trained men, chiefly for administrative supervision, and, finally, the Red Cross fills in the gaps in the needed personnel through its sanitary unit organization. Thus is built up the organization for the enforcement of the health laws and regulations which have been previously adopted.

The purpose of the work being carried on in these extra cantonment zones is the prevention of the spread of communicable diseases both among the civil population and from the civil population to the troops. The first essential in the control of communicable diseases is prompt information of when and where cases are occurring in the community. One of the first things undertaken by the officers in charge of zones, therefore, has been the establishment of relations with the practicing physicians whereby they will report promptly all their cases of communicable diseases. It is explained to them that if they fail to report their cases they are preventing the proper protection of the health of the troops. The health department with regard to each reported case takes such precautions as are indicated to prevent the further spread of the disease. The home of the patient is visited. Where possible, the source from which the sick contracted the disease is ascertained. The members of the household in which the case occurs are instructed regarding the manner in which the disease is spread and what precautions should be taken. The household is placed under supervision or a limited quarantine, or, if necessary, an absolute quarantine. If the disease is smallpox, or typhoid fever, diphtheria, or other disease immunity to which can be obtained by preventive inoculation of vaccines or antitoxins, such inoculation is given to the members of the household or persons exposed to the case.

In the small towns and strictly rural territory, the plan is to make a sanitary inspection of every home, paying particular attention to the water supply, the method of sewage disposal, and the presence of cases of communicable diseases in the household and to make inquiry regarding cases of sickness which have occurred in the recent past. This is also being done in some of the cities.

As regards malaria prevention, it is the intention to prevent the breeding of the anopheline mosquitoes in an area a mile wide immediately surrounding the mobilization camps. As the anopheline mosquitoes seldom, if ever, travel more than a mile, this will give protection to the troops within the camp. All practicable measures for the control of malaria will also be carried on throughout the entire civil zone to prevent the soldiers from becoming infected with malaria while away from the camp. The measures which are being employed and which will be carried on with increased vigor during the next malaria season—that is, next spring—are the draining, where practicable, of all swampy areas and accumulations of water in which anopheline mosquitoes can breed, the channeling of streams so that the water will flow quickly along its course, the oiling of such places as cannot be filled in or drained, the screening of houses, and the supervision and treatment of cases of malaria, including the prophylactic use of quinine by persons exposed to the disease.

The conditions under which milk is produced, handled and sold are being carefully regulated, and, where possible, pasteurization is being required.

Special attention is being given to the prevention of the fly nuisance, particularly in municipalities, where their breeding will be kept under control through the proper disposal of stable refuse and other accumulations in which flies lay their eggs and the larvæ develop.

The public water supplies of municipalities are being kept under expert supervision. Water mains are being extended wherever practicable, so that the greatest possible proportion of households may use the public supply. Hundreds of contaminated wells have been filled in to prevent their use.

School children are being kept under medical supervision for the early detection of cases of communicable diseases.

Free vaccination against smallpox is being offered to children and adults alike, also free vaccination against typhoid fever and paratyphoid fever. In some of the zones thousands of persons have already availed themselves of both the smallpox vaccination and the prophylactic inoculation against typhoid fever.

An important part of the work is that being done by the public health nurses. These most valuable adjuncts of the health department will keep under supervision cases of communicable disease, giving particularly close supervision to those cases in poor households where precautions against spread would ordinarily be at a minimum. They will keep under observation quarantined households, collect specimens for laboratory examination and be useful in a thousand and one other ways.

Active publicity and educational campaigns are carried on in all the zones, the purpose being to keep the people thoroughly informed as to just what the health administration is attempting to accomplish and why. Series of lectures are given at schools and at public meetings, and bulletins are distributed to the homes.

With regard to other work of the service incident to the war, as referred to in the beginning, the facilities of certain of the quarantine stations along the Atlantic seaboard are being greatly increased. Additional barracks are being built, hospital facilities enlarged, additional floating equipment and vessels for disinfection and fumigation secured, and all the necessary accessories incident to such work are being augmented. Should returning troop ships arrive in an infected condition, with dangerous communicable diseases on board, the troops and crew can be taken off and cared for at these stations and the vessels disinfected and returned to use with a minimum of delay. It is hoped that there will be little need for these quarantine stations because of infection among the troops. Experience, however, would indicate that there will be considerable use for them.

The facilities of certain of the other quarantine stations, both on the Atlantic and Pacific coasts, have been useful in various ways to both the War and Navy Departments. The twenty-three hospitals of the service, located in various ports, will probably be of increasing service as the war progresses.

Before the war the Coast Guard, formerly the Revenue Cutter Service, was under the Treasury Department and the medical officers of the Public Health Service furnished medical and surgical relief to the officers and enlisted men and in effect constituted its medical service. With the declaration of war, the Coast Guard became a part of the navy. With the Coast Guard vessels went the officers of the Public Health Service who were on them at the time, sixteen in number. The service is continuing to furnish on land medical and surgical relief to the Coast Guard, for whom it also makes physical examinations of applicants for commission and enlistment.

If the war is prolonged the Public Health Service will have much other work to do. What it is now doing must necessarily be considered but the beginning. The present war in many ways is one of nations rather than of armies. The human toll of the war will be for our country, as it is for other countries, not a matter merely of the numbers killed and wounded in battle but as truly a question of the numbers that will succumb because of the changes in civil life incident to the war. These changes are brought about by the increased amount of work to be done, longer hours of labor, the employment of women and children, the congestion of population in industrial centers. The increased cost of living will be a factor as will numerous other conditions incident to the equipping and maintaining of large armies in the field. All these things mean more physical disability and sickness. They mean increased health hazards and increased death-rates among the civil population. It is not improbable that the war toll of lives among the civil population may be numerically as great as that of the army. The nations which have been at war for some time have come to realize fully this fact.

If ever there was need for efficient health administration and sanitary control it will be during the present war. Certain of the allies found they had made the mistake during the mobilization of their armies of sending skilled mechanics to the trenches. They returned them to the munition plants. There is the danger that a considerable proportion of our all too few trained health officers will leave their work to join the fighting forces without having trained others to do their work in city and state health departments. That the nation may wage war with the greatest possible effectiveness there will be a pressing need for more extensive and efficient health supervision by state and municipal governments. There will be need of increasing the number of people engaged at this work by recruitment where possible from those not available for military duty or for work in the strictly war industries.

The federal, state and municipal health services have a work to perform which will demand their closest co-operation and will tax their resources to the utmost.

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RESULTS OF STUDIES ON EPIDEMIC POLIOMYELITIS.

E. C. Rosenow,
Mayo Foundation, Rochester, Minnesota.

Presented before the Laboratory Section of the American Public Health Association, Washington, D. C., October 20, 1917.

I ACCEPTED the invitation to present before the American Public Health Association the results of my studies on poliomyelitis with some hesitation, since the details of much of the work have not yet been published. However, I consented to do so in the belief that it might lead to a better and a wider understanding of the disease in its various manifestations.

Ever since Landsteiner and Levaditi and Flexner and Lewis demonstrated the virus of poliomyelitis to be filtrable, bacteria of ordinary size growing on ordinary media under aerobic conditions have been considered of little or no etiologic importance in this disease. My own studies were undertaken to determine, by methods used in other diseases, whether there is present in the infection atrium (tonsils, throat, adenoids, etc.) and in the involved tissues themselves, bacteria of the above type which might localize electively in the central nervous system of animals.

From July 21 to August 10, 1916, there were studied seven typical cases of epidemic poliomyelitis which occurred in Rochester. The cultures obtained from material expressed from the tonsils, injected intravenously in young animals (chiefly guinea-pigs and rabbits) was followed by flaccid paralysis in some of the animals in each case. On the basis of these striking results I decided to go to New York where these experiments might be repeated and where post-mortem material might be available. From August 12 to October 6, during the height of the epidemic in New York, in conjunction with Dr. E. B. Towne and Dr. G. W. Wheeler, the above results were verified with tonsil strains and extended to strains from brain and cord. At a later date, by the use of similar methods, similar results were obtained with brain and cord strains by Mathers, and Nuzum and Herzog. The extirpated tonsils of patients who were not convalescing as they should be and particularly those obtained in fatal cases, were found to contain peculiar abscesses in which this streptococcus was present in enormous numbers. Cultures of the brain and cord in each of twelve fatal cases yielded the identical streptococcus which also showed a marked tendency to invade the central nervous system of animals. The same organism has been isolated from the brain and cord of every monkey paralyzed either with fresh human virus, with glycerinated human virus, glycerinated monkey virus or with filtrates of virus. Moreover, it has been repeatedly isolated from glycerinated human and monkey virus months after glycerination and from filtrates of virus which were proved to produce poliomyelitis in monkeys.

Control cultures in numerous normal guinea-pigs and rabbits, and in inoculated monkeys dying of ulcerative colitis, showed streptococci in small numbers in a few instances only, and these were either culturally or immunologically different from those isolated from poliomyelitic tissues. On blood-agar plates the organism produces fine, dry, non-adherent, slightly green colonies, at times showing in forty-eight hours a narrow hazy zone of hemolysis. On this medium, as well as in ascites-dextrose agar, the organisms are quite uniform in size and resemble pneumococci, but are usually smaller and free from demonstrable capsule. In tall tubes of ascites-dextrose broth with or without sterile tissue there is usually an early diffuse turbidity, or there may be a flocculent growth which collects along the side of the tube and gradually settles to the bottom. Early smears show short chains of diplococci resembling pneumococci, a smaller number of medium-sized cocci in pairs, and occasionally very small coccus forms. In ascites fluid containing sterile tissue the growth appears as a slight haziness near the bottom of the tube on the fourth or fifth day when cultures are made of human or animal brain and cord. In a very few instances the early smears have shown the tiny globoid bodies described by Flexner and Noguchi in apparently pure culture, but usually there have also been a certain number of medium-sized diplococci in short chains, which Flexner and Noguchi and others have considered contaminations. Transplants from one to another of these liquid mediums disclose a marked tendency of the microörganism to change to the form characteristic of the medium in which it is planted. Thus, an apparently pure culture of the very small globoid bodies in ascites tissue fluid when transferred to ascites-dextrose tissue broth grows out rapidly, often in twenty-four hours, into the characteristic polymorphous streptococcus. Similarly a transplant from broth to ascites fluid tends to grow slowly smaller.

The mechanism by which the large forms become small has been demonstrated. Cultures of Berkefeld N filtrates of emulsions of brain and cord of rabbits dead from paralysis following intravenous injection, with suspensions of broth cultures showing only the large forms, have repeatedly grown out in this characteristic form in each of these culture mediums. Cultures showing the small forms have been filtered, and cultures of the filtrate have grown, but no growth has been obtained from filtrates of cultures of the same strains showing only large forms. The same emulsions filtered through dense porcelain candles have, with few exceptions, always been sterile.

In all the liquid mediums during the early days of growth, chains are often found in which there are single members of all sizes and shapes—large diplococci, large coccus forms, small diplococci and small coccus forms. Frequently, elongated forms resembling diphtheroid bacilli or distinct rods are found in chains which are made up chiefly of typical diplococcus forms. This has occurred in strains that have been fished successively several times from single colonies of shake and plate cultures, and in those from filtrates, and are therefore believed to be variations of one organism and not contaminations.

The importance of immunologic studies with this pleomorphic streptococcus to determine the exact relation between this organism and virus as generally understood, was recognized very early in the work. Recently isolated cultures were found to protect monkeys against virus (9). Horses have been immunized, one with cultures isolated a short time previously from brain and cord of monkeys paralyzed with virus, and another with those isolated from the cases of human poliomyelitis which occurred last summer (6). By means of these sera it has been determined that the strains isolated from human poliomyelitis and experimental poliomyelitis in the monkey (following injection of virus) are immunologically identical, both being cross-agglutinated specifically in high dilution by these sera respectively. Moreover, by selecting particularly sensitive strains with the immune horse sera, it has been found that the serum of patients and monkeys having recovered from poliomyelitic attacks likewise agglutinated specifically the strains both from human and monkey poliomyelitis. The serum from the horse (Horse 1) injected from Nov. 2, 1916, to May 10, 1917, with recently isolated strains from monkeys was found to have definite protection and apparently curative power against virus in monkeys.

The effect of this serum was tested recently on 56 cases of human poliomyelitis during the epidemic at Davenport, Iowa. The technic of the preparation and administration of the serum, the diagnostic tests and the results obtained in 44 cases have already been published. The details of the cases will appear later (7). Suffice it to state that all the 16 patients who received the serum before paralysis had set in recovered promptly without paralysis. All the 17 patients with slight paralysis who received the serum likewise recovered. In only one of these did the paralysis extend, and then only slightly. In all the others paralysis was arrested and recovery took place promptly. All will undoubtedly have complete restoration of function. Twenty-three patients had advanced paralysis when serum treatment was begun. Ten of these died, giving a mortality rate of 18 per cent. Seven were practically moribund when the serum was given, and hence cannot be counted against the serum. In the 3 remaining fatal cases the serum had time to act. One was a baby 11 months old, semicomatose with spasms eight days after the onset of the illness when the serum was first given. One, a boy 2 years old with cyanosis, marked tremors, high fever, severe gastro-enteritis and beginning respiratory paralysis on the second day at the time of the first injection; and one, a girl 11 years old, with high fever and paralysis of the face on the third day when the first dose of serum was given. Hence this makes a mortality of about 6 per cent. in sharp contrast to the 9 deaths which occurred in 23 untreated cases; a mortality rate of 35 per cent.

The epidemic in Davenport differed from those studied last year in Rochester and in New York in that gastro-intestinal symptoms and the symptoms referrable to the central nervous axis were more pronounced, and that the mortality rate was higher in the cases in which serum treatment was not used. The results obtained last year with reference to the tonsils as affording an important place of entrance for the infection, have been verified and extended. Glandular enlargement was found in many cases to be in proportion to the evidence of infection in one or both tonsils, as obtained on examination of the patient and on dissection of the tonsils after death.

The identical streptococcus has been found in enormous numbers in the characteristic abscesses in tonsils. It has been isolated from brain and cord in all fatal cases in which cultures were made, and from monkeys paralyzed with the new virus. As occurred last year, injection of recently isolated cultures into animals was followed by characteristic localization. Very little or no evidence of contact-infections could be found. The occurrence of more than one case in a family was rare and in such instances the attacks were close together. A careful study of the state of health of others in the family in which typical cases occurred, and of the general health of the community at the time of the epidemic, the details of which will appear subsequently, brings with it the conviction that a large proportion of the population harbored the infection and that only one case out of the usual number (1 in 600 to 1 in 1,000 inhabitants) developed the typical symptom complex recognized as poliomyelitis. From the studies detailed here the infection appears to be due to a form of streptococcus (using this term in the broad sense) having peculiar localizing powers. In this connection it is of interest to note that the incidence of poliomyelitis in families and the community at large during epidemics in summer, is about that of rheumatic fever or pneumonia during the colder seasons when the more virulent streptococcal respiratory and tonsillar infections occur in epidemic form.

REFERENCES.

1. Flexner, S. and Lewis, P. A.: The nature of the virus of epidemic poliomyelitis. Jour. Am. Med. Assn., 1909, liii, 2095.

2. Flexner, S. and Noguchi, H.: Experiments on the cultivation of the microörganism causing epidemic poliomyelitis. Jour. Exper. Med., 1913, xviii, 461–485.

3. Landsteiner, K. and Levaditi, C.: La transmission de la paralysie infantile aux singes. Compt. rend. Soc. de biol., 1909, lxvii, 592–594.

4. Mathers, G.: Some bacteriologic observations on epidemic poliomyelitis. Jour. Am. Med. Assn., 1916, lxvii, 1019.

5. Nuzum, J. W. and Herzog, M.: Experimental studies in the etiology of acute epidemic poliomyelitis. Jour. Am. Med. Assn., 1916, lxvii, 1205–1208.

6. Rosenow, E. C.: The production of an antipoliomyelitis serum in horses. Jour. Am. Med. Assn., 1917, lxix, 261–265.

7. Rosenow, E. C.: The treatment of epidemic poliomyelitis with immune horse serum. Preliminary report. Jour. Am. Med. Assn., 1917, lxix, 1074–1075.

8. Rosenow, E. C. and Towne, E. B.: Bacteriological observations in experimental poliomyelitis of monkeys. Jour. Med. Res., 1917, xxxvi, 175–186.

9. Rosenow, E. C., Towne, E. B. and Wheeler, G. W.: Observations on immunity of monkeys to experimental poliomyelitis. Jour. Am. Med. Assn., 1917, lxviii, 280–282.

10. Rosenow, E. C., Towne, E. B. and Wheeler, G. W.: The etiology of epidemic poliomyelitis. Preliminary note. Jour. Am. Med. Assn., 1916, lxvii, 1202–1205.

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THE EVOLUTION OF COUNTY HEALTH WORK.

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Secretary, North Carolina State Board of Health, Raleigh, N. C.

Read before the Public Health Administration Section, October 17, 1917, at Washington, D. C.

UNDER this heading I wish to direct your attention to three phases of the county health problem, to wit: (1) The field of county health work, (2) the nature of county health work, and (3) the natural growth of county health work.

The Field of County Health Work.

A permanent and large field of county health work rests upon due observance of two important principles of our government. The first of these principles is that which provides unrestricted opportunity, and the second principle is that which recognizes the wisdom of limited assistance.

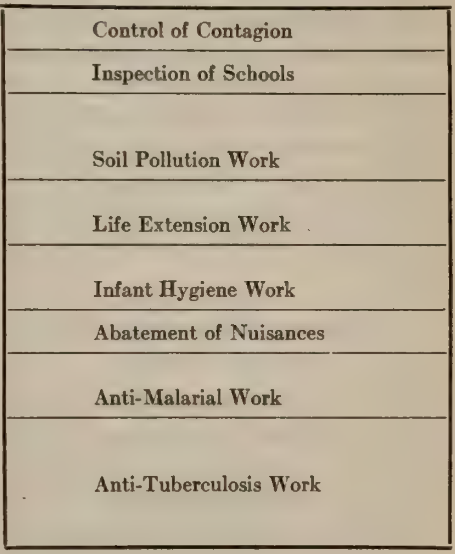
The principle of unrestricted opportunity is provided through the division of the central government into a descending series of smaller governments. This arrangement permits the smaller division to move forward without waiting for mass movement, naturally clumsy and slow. A state without waiting for national prohibition may adopt state prohibition. A county without waiting for state prohibition may have local option. Just so in the field of human conservation. A state or a county need not wait on the national government to move. Moreover, if the national government moves, and moves as far as it can, there will remain a large field for state health work. And again, if the state government moves, and moves as far as it can, there will remain large opportunities, with correspondingly heavy responsibilities, for the county, as indeed, will still be the case with the individual when nation, state, and county have exhausted their resources for human conservation.

The second principle of a wise limitation of assistance makes it necessary that the county shall occupy its own field of health work. For a parent to do for a child, or for a parental government to do for the smaller constituent unit of government that which it should do for itself is to cause loss of interest, apathy, atrophy, dwarfism, paralysis, death. Trial, experience, self-reliance are as essential to symmetrical development as food. Parents and parental governments should point out duties, encourage utilization of opportunities, and assist the child but not do for it those things that it should do for itself. There is a field of county health work, a field of health work which only the county can rightfully occupy.

The Nature of County Health Work.

The nature of anything is best appreciated when approached through the analytical process. Problems of social physiology and social pathology are most clearly understood when broken down into their elemental parts. The county health problem is best appreciated when resolved into its elements, into units of county health work. The unit conception of county health work is represented graphically and simply in the following figure:

COUNTY HEALTH WORK



This diagram shows the units from above downward in the order in which we in North Carolina attack them. The variations in space allotted to the different units indicate our estimate of their relative costs. The number of units is not essential. Sanitarians of equal standing will subtract or add to our simple diagram. The order in which the units are placed is not essential. Sanitarians of equal standing will arrange the units in different orders. The relative cost of the units, as indicated in the diagram, is not essential. Sanitarians of equal standing will re-arrange the budget. The detailed plan for dealing with any particular unit is not essential. Sanitarians of equal standing will have different and equally effective plans for handling the same unit. The one and only essential in this conception of the nature of the county health problem is its unit structure.

The unit conception of county health work enables us (1) to attack the county health problem through a detailed plan and with a definite object, (2) to attack the county health problem effectively either in part or as a whole, (3) to cut the garment to fit the cloth, or to plan our county work to fit the available resources of the county.

THE NATURAL GROWTH OF COUNTY HEALTH WORK.

The aforestated conception of the nature of county health work would lead us to expect its natural growth to be by units. Moreover, the past development of county health work and the present direction of its growth indicate the first stage as—

THE OPTIONAL UNIT OF COUNTY HEALTH WORK.

This first stage in the growth of county health work has been going on, rather vigorously, I think, we might say, since 1911. During the last six years nearly all the counties of the South have made appropriations to be expended on a unit of work directed, first, against hookworm disease, and later, the larger phase of that problem, soil pollution. Counties in the South have probably expended something like $1,000,000 on this unit. Counties in one state have expended $13,000 in the last two years on a unit of typhoid vaccination (not shown in the diagram) and in this way have vaccinated 128,000 people at an average cost to the county of approximately ten cents a vaccination. Another unit that has been successfully carried out is a medical inspection of schools unit. A unit of county control of contagions has been tried successfully. A unit of life extension work, similar to the work of the Life Extension Institute in New York for the employees of large corporations, is being attempted, and so far with encouraging results.

In the development of county health work on the optional unit basis, the state health authorities proceed as follows: First, an entity or unit of county health work is selected, a plan for dealing with the unit, complete in every detail, including necessary literature, illustrated lectures, press articles, forms, necessary time to finish, force of workers needed, and budget is prepared. Second, the state authorities then propose to a county that for a definite appropriation, usually 75 or 80 per cent. of the actual cost of the unit, amounting to from $200 to $2,000, they will carry into effect the plan of work as submitted. Third, the state authorities are responsible to the county and the work is therefore supervised by the state and carried out by employees of the state.

THE PRESCRIBED UNIT OF COUNTY HEALTH WORK.

The General Assembly of a state in which the counties had been using two optional units of county health work recently made the optional units prescribed units for all the counties. The work prescribed for the county is carefully detailed and the county is required to pay a definite sum on certification from the state officers that the local official has satisfactorily performed his duties. This legislative transformation of the optional into a prescribed unit of health work appears to be the most natural course the development of county health work could take and will take.

THE COUNTY HEALTH DEPARTMENT.

The county health department will be the third and last stage in the development of county health work. This stage of growth will be reached when the prescribed plus the optional units of work, for which the county has become responsible, require a permanent force of workers and necessitate an annual budget amounting to at least $3,500. A county department of health developed as an outgrowth of the unit plan of work would naturally possess the carefully detailed plans, the definiteness of object and the well thought out budget of the unit principle.

The county department of health should not be confused with the whole time county health officer idea. There are two important differences: First, in the whole time county health officer idea the dominant thought is an official; in the county health department idea the dominant thought is a plan of work. The whole time county health officer idea does not necessarily, and, as a matter of fact, does not nine times in ten, include a plan of procedure. The county health department idea starts out with a comprehensive and detailed plan of work which includes, as an essential part, a properly qualified and paid health officer. Second, the whole time county health officer receives from six to seven dollars a day for his services and devotes from 35 to 60 per cent. of his time to work that can just as well be carried on by clerical help that can be obtained for from two to three dollars a day. The county health department plan prevents waste of this kind by providing adequate clerical assistance.

ACCELERATING NATURAL GROWTH.

There are two ways of accelerating growth: fertilization and cultivation.

The fertilizer for county health work is a county subsidy. To illustrate the application: In a certain state there are in process of establishment ten county health departments. Five of the ten are manned and in operation. These departments are planned on the unit basis and are maintained on an annual budget of $6,000 a year. Of this amount, 50 per cent. during the first year is contributed jointly by the State Board of Health and the International Health Board; 40 per cent. during the second year is contributed by these assisting agencies; and 25 per cent. during the third year. During the fourth year, and after, the county pays the entire cost. The plan has become sufficiently well rooted to withstand both the cold of public indifference and the heat of political friction. The county subsidy is the fertilizer for county health work —for county health work in any of its three stages of growth.

But cultivation is even more necessary for growth than fertilization. This applies to the growth of the seed of conduct, ideas, as well as to the growth of the seed of vegetation; and it applies to the growth of the seed in that higher transformation of dust that we call brain as well as to the growth of the seed in the dust that we call soil. The place of the subsoiler, the plow, the harrow, the cultivator, the hoe, in the cultivation of the seed of vegetation must be taken in the cultivation of the seed of sanitary conduct by the health bulletin, pamphlets and leaflets on preventable diseases, health exhibits, health press service, and health lectures.

"Behold a sower went forth to sow." Some seed fell by the wayside, some in stony places, some among thorns. Others in good ground. The hard places by the wayside, the hard-headed indifference and conservatism of the backward-looking people must be broken up, agitated, softened, for the reception of new ideas. The shallow soil of stony places, the effervescent enthusiast who gets religion quickly, who promises all and produces nothing, must be made to think deeper. The thorns, the antivivisectionist, the antivaccinationist, and other faddists—noxious plants—must be dug up and not allowed to take away the nourishment from useful plants. The good ground that produces sixty-fold must be agitated and cultivated until it produces a hundred-fold.

To conclude: The rate of growth of county health work will depend on (1) the way you fertilize or subsidize it, (2) the way you cultivate sanitary ideas, the way you till the soil of public thought.

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As the MAILING LIST for each month's issue closes on the first of that month, changes of address, renewals, subscriptions, etc., must reach us before that date to be effective with that issue.

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THE LOCAL HEALTH OFFICER IN NATIONAL DEFENSE.

One of the most conspicuous features of the recent Washington meetings of the Association was the emphasis laid upon the necessity for coöperation in war work on the part of the local health officer.

In introducing Mr. Hoover the chairman intimated that there were 15,000 officials in the United States, who could be of material service to the Food Administration. Mr. Hoover's response was an appeal to the profession for aid in educating the public regarding the problem of food conservation.

Again, the health officer is asked to assist in providing healthful conditions in zones surrounding cantonments suppressing venereal disease, and by guarding the health of munitions workers. In some instances he has manufactured sera and vaccines for military use.

Finally we have the health of the civil population to consider. We hope to have several million men on the battlefields of France. It will require a healthy civilian nation to keep them supplied with the means of warfare. Consider, for a moment, the disastrous effect of a typhoid epidemic in a city preparing munitions, clothing, or food for our armies. The need for saving the babies is now even more important than before the war.

Health appropriations should be increased, not diminished. But especially let the local health officer earnestly study the health problems created by the war and devise means to meet them.

VENEREAL DISEASE SYMPOSIUM TO APPEAR IN "SOCIAL HYGIENE."

At the request of Major W. F. Snow, President of the American Social Hygiene Association, the papers comprising the venereal disease symposium delivered at the Washington meeting of the Public Health Administration Section on October

18, will be published in the January number of *Social Hygiene*, the official organ of the American Social Hygiene Association. The meeting in question was a joint meeting between the two organizations.

The papers involved are those of Colonel Russell, Surgeon Holcomb, Mr. Fosdick, Assistant Surgeon-General Kerr, and Assistant Surgeon-General Frost.

A free copy of *Social Hygiene* will automatically be mailed to all members of the American Public Health Association by the publishers, whose address is 105 W. 40th St., New York City.

TWO NEW NOTE SECTIONS FOR THE JOURNAL.

Beginning with this issue, the JOURNAL will have each month two note sections entitled "Public Health Laboratory Notes" and "Association News," respectively.

The "Laboratory Notes" are intended primarily for the man who is unable to follow the literature closely, but still wishes to remain informed of progress. The "Notes" are not intended to supplant the class periodicals devoted to chemistry, bacteriology and pathology, but more to supplement and call attention to them, while at the same time giving such specific information which no sanitarian can afford to miss.

As the name implies, this section will deal only with reviews of a public health nature.

The preparation of abstracts will be in the hands of Dr. Arthur Lederer, Director of the West Virginia State Hygienic Laboratory. Experience and training have given Doctor Lederer excellent qualifications along these lines, and we may look to him for an interesting and valuable note section.

The "Association News" will serve to remind us that the Association is doing its work throughout the year, and not at annual meetings alone. News will be given out regarding the work of the central office, the executive committee, and special committees; and it is requested that section officers send each month such items as would be of general interest to the Association members.

THE PERIOD AFTER "PER CENT."

In common with other scientific publications, the JOURNAL has in the past used the dot after "per cent." The expression is an abbreviation of the Latin *per centum*, hence the custom.

There are at present a number of objections to the practice, however: first, it causes needless inconvenience; second, the period may be mistaken as indicating the end of a sentence instead of an abbreviation; third, it produces a hybrid expression. "Per cent." should be either Latin or English. That it is not Latin is indicated by the absence of italics, which even purists omit. Then, if English, why hang on to the period, which refers it back to *per centum!*

Ergo, vanish the dot after January 1, 1918.

Contributors to the JOURNAL are asked to take notice. We hope that the editors of other scientific journals will take the question under advisement.

THE DETERMINATION OF ICE CREAM AS A FACTOR IN THE SPREAD OF TYPHOID FEVER INFECTION.

L. L. LUMSDEN,

Surgeon, United States Public Health Service, Washington, D. C.

Read before the Public Health Administration Section at Washington, D. C., October 17, 1917.

AN OUTBREAK of typhoid fever in Birmingham, Ala., in the summer of 1916, and another in Chattanooga, Tenn., in the summer of 1917, were found on investigation to present strikingly similar epidemiological features. From the evidence obtained it was concluded that each of these outbreaks was caused by ice cream borne infection.

The outbreak in Birmingham occurred in the period June 9 to July 15, and comprised about 350 cases in excess of the average number for the corresponding period of the several previous years. The outbreak in Chattanooga occurred in the period July 15 to August 15, and comprised about 75 cases in excess of the average number for the corresponding period of the several previous years.

The excessive case incidence in Birmingham was 1 to about 428 of population, and in Chattanooga 1 to about 666 of population. In each outbreak the excess of cases over the usual corresponded approximately to the excessive number of cases giving a definite history of exposure to the implicated ice cream supply.

EPIDEMIOLOGICAL FEATURES.

The findings in each of these two outbreaks are regarded as fairly representative of the epidemiological features which may be expected generally to be found in extensive urban outbreaks of typhoid fever caused by ice cream borne infection.

Distribution. The disease spread generally throughout the city and fell especially upon the better residential sections. The case incidence was higher among those living under the best sanitary conditions than among those living under the poorest sanitary conditions. Children between five and fifteen years of age living under good economic conditions furnished a strikingly large proportion (about 30 per cent.) of the cases. At several places outside the city at which, during the period of causation of the outbreak, some of the suspected ice cream supply was distributed, groups of cases among users of the ice cream developed synchronously with the cases constituting the outbreak in the city. The distribution of the outbreak corresponded roughly to the distribution of the implicated ice cream supply.

Character. Each of the outbreaks was somewhat explosive in character. The periods of causation appeared to be about one month in duration. In each instance, however, between 30 and 40 per cent. of the cases developed within a period of seven days, suggesting that the outbreak may have been caused in large part by infection distributed in one day. The cases generally appeared in duration of attack, in severity of symptoms and in fatality to strike a medium between the average for outbreaks caused by waterborne infection and the average for outbreaks caused by milk-borne infection. A particularly interesting feature was the frequency of short prodromal periods. A large majority of the cases gave a history of prodromes for about three days. The sudden development of severe symptoms causing the person to take to bed at once was much less frequent than is the rule in instances of milk-borne infection.

Dosage. The number of cases to develop among persons who within the two years prior to the attack had received anti-typhoid inoculation suggested that the dosage of infection, as has been found to be the case in milk-borne infection,* was sufficient to overcome the resistance furnished by the inoculation. The proportion of the population of Birmingham and Chattanooga which prior to the outbreaks had been inoculated against typhoid is not known. It is improbable, however, that it reached 10 per cent. Between 5 and 10 per cent. of the cases in each outbreak gave a history of having had the inoculation within two years prior to onset of illness. Whether the vaccine which had been used in these persons was of standard potency is not known. But along with the outbreak in Chattanooga, a group of cases of typhoid fever developed among soldiers at Fort Oglethorpe, Ga., who had been exposed to the ice cream supply. All of the cases in this group were in persons who within the two years—and some within three months—prior to attack of illness had been inoculated with army vaccine. It is assumed that the potency of the army vaccine was up to standard.

DETERMINATION OF ICE CREAM AS VECTOR OF INFECTION

In extensive and explosive outbreaks of typhoid fever in cities, such as the one in Birmingham and the one in Chattanooga, the general epidemiological features suggest that the vector of infection has been some drink or food extensively distributed over the city. The geographical distribution and the class of persons especially affected, if ascertained with a reasonable degree of accuracy, tend to eliminate flies, personal contact and local insanitary conditions as preponderant factors in the spread of the infection. To bring under reasonable suspicion or to eliminate definitely a water supply or a milk, ice cream or other food supply, good leads can be found as a rule only by a careful collection of detailed data at the homes of the individuals attacked with the disease.

Accurate Collection of Data. Definite histories about one's use of water supplies and milk supplies are as a rule more easily obtainable than is the history of exposure to ice cream supplies. One who is fond of ice cream and who is able to indulge freely in this delicacy will usually, within any period of two or three weeks in the summer season, have eaten ice cream in a number of different places. Free users have difficulty in recalling even the majority of the places at which they have recently eaten ice cream. The most important light on the situation may be obtained from the histories of persons affected who have eaten ice cream only a few times—perhaps but once—within the two or three weeks prior to onset of illness. Whenever practicable, the patient should be interviewed. Unless the interview at the home of the patient and at the other places at which the ice cream was eaten is conducted painstakingly, tactfully and thoroughly, the history of exposure of the person affected to the infected ice cream supply may be readily missed. The following is typical of many instances in the course of the investigation in Birmingham and Chattanooga: The mother of the boy ill with typhoid is interviewed.

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*Geiger, J. C.: A milk-borne epidemic of typhoid fever due to the use of polluted water, with five failures of typhoid immunization.—Jour. A. M. A., March 31, 1917, p. 978.

Question. "Did your son eat ice cream within the two or three weeks before he took sick?"

Answer. "No, he did not like ice cream."

Q. "Are you sure he did not eat it at all?"

A. "He may have, but he certainly did not eat it often."

Q. "Can you recall any time when he did eat it?"

A. "Let me see. Why, yes, now I remember, he did eat ice cream once at the drug store down here at the corner."

Q. "When was that?"

A. "It was about two weeks before he took sick."

Q. "Do you know what ice cream is served at the drug store?"

A. "I think it is the 'A' ice cream."

Q. "But you are not sure?"

A. "No, I am not sure."

Q. "Do you think the little boy ate ice cream at any place besides this drug store?"

A. "No, I'm pretty sure he did not."

It is then ascertained that the patient is well enough to be interviewed.

Q. "John, how about ice cream, did you eat it sometimes in the two or three weeks before you got sick?"

A. "Yes, sir, every now and then."

Q. "Where did you eat it?"

A. "At the corner drug store."

Q. "Anywhere else?"

A. "Yes, at the confectionery shop across the street.."

Q. "About how many times in the three weeks before you got sick did you eat ice cream at the confectionery shop?"

A. "Three or four times."

A visit is then made to the drug store and to the confectionery shop and the proprietor at each is interviewed.

Q. "What ice cream do you sell?"

A.—"B's."

Q. "Any other?"

A. "No."

Q. "Have you sold any obtained from any manufacturer other than 'B' within the last six months?"

A. "No, I've been getting my supply from 'B' for over three years."

Q. "You have not run short at any time within the last eight weeks and bought a part of your supply from some other manufacturer?"

A. "Why, yes, for two or three days sometime ago 'B' was unable to supply me and I bought from 'X'."

Q. "Will your books show when that was?"

A. "Yes (looking at books), it was July 15, 16 and 17." The onset of illness of the patient was July 28.

Implication of Ice Cream Supply. By carefully collecting in this way the data about foods and beverages, evidence may be obtained early in the investigation of an outbreak caused by ice cream borne infection pointing to the ice cream supply which is responsible. The proportions of cases giving a history of exposure to the different ice cream supplies must be compared with the proportions of the total ice cream supply of the city which are furnished by the different dealers before a conclusion is reached that the number of cases among the users of ice cream from any one supply is excessive. In the Birmingham outbreak 55 per cent. of the cases gave a definite history of exposure to one ice cream supply which furnished less than 20 per cent. of the total supply of ice cream consumed in the city. In the Chattanooga outbreak 86 per cent. of the cases gave a definite history of exposure to one ice cream supply which furnished, according to the most reliable evidence obtainable, about 30 per cent. of the total supply of ice cream consumed in the city. In each of these outbreaks the number of cases among the users of ice cream from other large supplies was roughly proportionate to the amount of ice cream distributed. In outbreaks such as the one in Birmingham and the one in Chattanooga, the preponderance of cases among the users of ice cream from one supply is regarded by the writer as practically conclusive evidence that the ice cream supply has been the vector of the infection, unless it can be established beyond reasonable doubt that the ingredients of the ice cream and the ice cream itself have been collected and handled in such a way as to prevent the introduction of infection, or that they have been treated in such a way as to insure destruction of whatever infection may have been introduced into them. The finding of a case of typhoid fever or a carrier of typhoid infection at one of the farm sources or at the factory furnishes corroborative evidence, but does not appear essential to the reaching of a definite epidemiological conclusion. The case or carrier furnishing the infection may have recovered or have left the premises before the search for the human source of the infection at farms and factory is begun. The ice cream supplies concluded to be responsible for the outbreaks in Birmingham and Chattanooga were found at both farm and factory sources to have been exposed through fingers, flies and other agencies, to contamination with human excreta. In the period of causation of the Birmingham outbreak three cases of typhoid fever existed at one of the dairy farms supplying milk used in the manufacture of the implicated ice cream supply. The existence of the cases and the insanitary conditions in respect to the disposal of human excreta on these premises were suggestive, but not *proof* that the infection causing the outbreak had its origin at this farm. The mixture for making the ice cream implicated in the Birmingham outbreak was not pasteurized nor otherwise treated so as to destroy whatever infection may have been introduced into it at its sources. The mixture for making the ice cream implicated in the Chattanooga outbreak was invariably, according to the evidence, run through a "flash" pasteurizing machine, but it was positively established that this machine on some occasions did not pasteurize.

Elimination of Other Potential Factors. In both the Birmingham and the Chattanooga outbreaks factors other than ice cream likely to operate in the spread of infection causing such outbreaks were eliminated on epidemiological evidence obtained from field and laboratory studies. There was no suggestive preponderance of cases among the users of milk from any supply other than those used in the making of the implicated ice cream. In the periods of causation of the outbreaks the public water supplies were free from all evidence of dangerous pollution. The number of cases giving a history of exposure to water supplies other than the public city supplies was not sufficient to signify that these water supplies had played a very considerable part in the spread of the infection. The public water supply of Birmingham is obtained from two different sources and treated and distributed from two different plants. In the period of the outbreak the prevalence of typhoid fever was just about the same in the areas of the city supplied with water from the two different sources.

CONCLUSIONS.

1. The part played by ice cream, though probably not relatively so great as the part played by water, milk, fingers or flies in the spread of typhoid and other infections, is important and deserving of the serious attention of health officials.

2. The dosage of typhoid infection in ice cream may be sufficient, as is the case with milk supplies, to overcome the additional resistance furnished by anti-typhoid inoculation and for that reason the elimination from the dietary of vaccinated persons, including the military forces, of ice cream which is not determined with reasonable certainty to be free from the likelihood of infection is of particular importance.

3. Unless investigations of typhoid situations are conducted painstakingly and thoroughly, evidence which would definitely establish an ice cream supply to be the vector of infection may be missed.

4. Extensive outbreaks of typhoid fever caused by ice cream borne infection can be readily determined by careful epidemiological studies, but even very careful and thorough investigations may fail to determine the medium of conveyance in small numbers of cases caused by ice cream borne infection.

5. The exercise of cleanliness in the collection and preparation of all ingredients entering into the composition of ice cream supplies, the proper pasteurization of ice cream mixtures, and the exercise of a high degree of cleanliness in the manufacture and distribution of ice cream—all under rigid and adequate official supervision—are highly indicated in order that this delectable and economic delicacy may be distributed freely and safely for human consumption.

BACTERIAL CHANGES IN UNICED SPECIMENS OF WATER AND DESCRIPTION OF A CONTAINER FOR THE TRANSPORTATION OF ICED SPECIMENS OF WATER FOR BOTH CHEMICAL AND BACTERIOLOGICAL EXAMINATIONS.

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INTRODUCTION.

THE purpose of the investigation here reported is to note the bacterial changes that take place in uniced specimens of water with the object of determining to what extent reliance may be placed on the results of bacteriological examinations of water thus sent to a laboratory some distance away.

There is no longer any question as to the desirability of making both chemical and bacteriological examinations to determine the potability of water.

Some years ago, when as a rule, only chemical examinations were made, it was customary to send water considerable distances to laboratories. There was consequently an interval of from several hours to several days between the time of collection of the specimen and the time of making the examination. Such was not a matter of so much importance since chemical changes do not take place as rapidly as bacterial changes and do not, therefore, as materially modify the conclusions reached relative to the potability of the water. On the other hand, it is well known that bacteria will multiply rather rapidly, at least for a time, in water which comes from a cool source of supply and which is allowed to remain at ordinary room temperature. These changes are sufficient to vitiate the results of bacteriological examinations if dependence were placed on such alone.

During recent years, constantly increasing provisions have been made by state authorities for the examination of water on a state-wide basis at or through some central laboratory. Although it is obviously desirable to make the examinations at the place where the water is collected in order that the examination may be made, or at least started, immediately after collection, it is also very obvious that such a procedure involves very much more expense than present appropriations will permit. It is possible also, that the greater expense which would thus be incurred is not justified by the results obtained. As far as chemical examinations are concerned, with the exception of such determination as dissolved oxygen, it does not make so much difference whether such are made at the place where the water is collected or at some distant laboratory since the changes which occur during transportation are, as a rule, of less importance. On the other hand, the bacteriological changes are such as to have led to a diversity of forms of practice relative to the method of conducting bacteriological examinations. Some make, or what amounts to the same thing, start the examinations at the place of collection. Others send small specimens, packed in ice, to a distant laboratory. It has been demonstrated that when such is properly done, practically no bacterial changes will take place within the time usually required to send a specimen across a state. This means the sending of two specimens of water from each source of supply—one small one, iced, for bacteriological examination, and one larger one, uniced, for chemical examination, or going to the considerably greater expense of sending a large specimen in a container with ice. The question may, therefore, properly be asked, if with the nature of the source of supply and the results of the chemical analysis known, it is not possible to depend on the results of the bacteriological examinations of uniced specimens of water—knowing what changes in bacterial content are likely to occur. It is for the purpose of answering this question that a series of examinations were instituted.

Method of Investigation to Determine the Nature and Extent of Bacterial Changes in Uniced Specimens of Water.

Specimens of water were collected from forty different sources of supply in the neighborhood of the laboratory. The sources of supply were of various kinds and represented various degrees of pollution with sewage material. Specimens for bacteriological examination were collected in sterile, rather tall, one-gallon glass-stoppered bottles —the same type of container used for the submitting of specimens from various parts of the state to the laboratory. The stoppers were covered with a piece of clean cloth which was tied down around the neck of the bottle. These bottles were placed in felt-lined cases such as are regularly used in the transmission of specimens. They were returned to the cases promptly after examination. An additional specimen was secured for chemical analysis. Immediately on arrival at the laboratory, the temperature of the water was taken with sterile thermometers. One cubic cen-

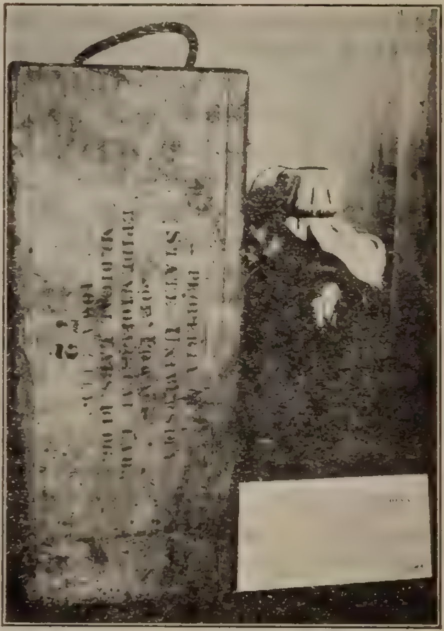

Fig. 1.—The Old Container.

timeter and one-tenth cubic centimeter quantities were then plated on nutrient agar and lactose-litmus agar and introduced into tubes of lactose broth—all media having been prepared in accordance with methods given in the second edition (1912) of "Standard Methods of Water Analysis" of the Laboratory Section of the American Public Health Association. The nutrient agar plates were placed in an incubator at 20° C. and the litmus-lactose plates and tubes of lactose broth in an incubator at 37° C.

This procedure, including the taking of the temperature and the inoculation of the media and pouring of plates, was repeated at the end of 8, 24, 48, and 72 hours after the collection of the specimens. The bottles were thoroughly shaken before specimens were removed for examination.

The nutrient agar plates were removed from the incubator at the end of 48 hours and the number of colonies counted. The litmus-lactose agar plates were examined at the end of 24 hours, and a count was made of both the total number of bacteria and the number of red colonies. The presence or absence of gas formation in the tubes of lactose broth was made after an incubation of 48 hours. A sanitary survey of the source of supply and a chemical analysis of the water was also made.

Results of Examinations of Uniced Specimens of Water.

The results of the examination are set out in the accompanying table. It was thought best to primarily list the waters in three classes—namely,

FIG. 2.—BACTERIAL CHANGES IN UNICED WATER SAMPLES.

Hours	Sample Number	Temperatures					20°C.					37°C.					Red Colonies					Gas				
		0	8	24	48	72	0	8	24	48	72	0	8	24	48	72	0	8	24	48	72	0	8	24	48	72
Good........	38	24°C.	24°C.	25°C.	23°C.	22°C.	49	90	350	1500	1200	0	0	10	600	16	0	0	1	0	1	+	–	–	–	+
	40	21°C.	24°C.	25°C.	23°C.	22°C.	12	29	60	120	55	0	0	0	4	210	0	0	1	0	1	–	–	–	–	–
Ave..........							15	43	152	604	556	4	2	4	185	163	0	0	–1	0	–1	4 – 2 +	5 – 1 +	4 – 2 +	3 – 3 +	4 – 2 +
Ques.........	13	16°C.	21°C.	25°C.	25°C.	24°C.	320	425	600	1200	600	46	55	800	48	150	4	3	Acid	6	6	+	+	+	+	+
Ave..........							406	493	1009	1325	1148	44	39	181	219	195	1	1	1	1	1	2 – 4 +	2 – 4 +	3 – 3 +	0 – 6 +	0 – 6 +
Bad.........	18	16°C.	21°C.	25°C.	25°C.	24°C.	500	300	1500	4000	800	200	35	13	19	11	2	1	0	0	1	+	+	+	+	+
Ave..........							279	123	404	914	352	49	21	134	8	89	1	1	0	–1	–1	1 – 5 +	1 – 5 +	1 – 5 +	1 – 5 +	3 – 3 +
Ave. of 40 Samples....							280	527	728	1185	827	52	138	139	214	384	2	2.2	2.5	2.5	2.7	11 – 29 +	15 – 25 +	11 – 29 +	10 – 30 +	13 – 27 +

good, questionable, and bad, as determined by both a sanitary survey and a chemical analysis—having in mind the question of sewage pollution. There were a number of specimens which were considered "good" by either the sanitary survey or the chemical analysis but "questionable" or "bad" by the other. Because of the undesirability of introducing a rather uncertain factor, the bacteriological findings of these specimens have not been included in this table. Both one cubic centimeter and one-tenth cubic centimeter quantities were used for all of the bacteriological determinations. It was found, however, that the difference in results was so slight that only the one cubic centimeter findings were tabulated.

These examinations were made in the month of July; consequently the temperature and, likewise, the bacterial changes are more marked than would be the case during the greater part of the year. It has been shown that bacterial increase is greater in small bottles than in larger ones, due no doubt to the greater rapidity in the rise of temperature. For that reason, as well as for the amount of water required for chemical analysis, one gallon containers were used in collecting the specimens.

DEDUCTIONS BASED ON THE EXAMINATION OF UNICED SPECIMENS OF WATER.

1. The average total number of bacteria per cc. in six specimens of water which were regarded as "good" by both a sanitary survey and a chemical analysis, was very low (only 12) when the water was first collected, increased to slightly more than 100 at the end of 24 hours, and to nearly 700 at the end of 48 hours.

2. The average number of bacteria per cc. in the above named specimens of water incubated at 37° C. remained low (4) for the first 24 hours but increased to almost 200 by the end of 48 hours.

3. There were no acid producers in the above-named specimens of water at the beginning and, with one exception, none appeared within 48 hours. It would of course be expected that with the increase in the number of bacteria, there would likewise be some increase in the number of any acid-producers that may be present.

4. Two of the six above-named specimens of water contained gas-producers at the beginning. This proportion was not materially increased during the first 72 hours after collection. The same absence of increase of gas-producers was noted in the entire group of 40 specimens. It would, therefore, seem that about as much dependence may be placed on the "gas formation" determination at the end of 48 or 72 hours as at the time of collection.

NECESSITY OF A NEW WATER CONTAINER.

It will be seen that the results of the bacteriological examinations of uniced specimens of water are not always satisfactory. Soon after these determinations were made, we learned of the very satisfactory results which had been obtained by Penniman and Enslow of the Maryland State Board of Health with small samples of water for chemical analysis. We concluded that if we could confirm the results of Penniman and Enslow's work to our satisfaction, the icing of a sample of such size would not be as prohibitive in cost as the sending of a gallon container iced. We found the results of the chemical examination of such a small sample of water to be satisfactory. We therefore devised a new water container which we have since adopted as the standard water container of the laboratories for the Iowa State Board of Health.

Description of a Container for the Transportation of Iced Specimens of Water for Both Chemical and Bacteriological Examinations.

Our container consists of a wooden box lined with galvanized iron. Between the galvanized iron and the wood is a half-inch layer of felt, the purpose of which is to reduce the effect of outside temperature. The inner chamber is 9″ x 9″ x 10″ and since the wood used in the box is ¾″ stock, the outside dimensions are 11½″ x 11½″ x 13″. The top of the box is hinged and is provided with a hasp so that it may be locked or sealed. There is a handle on the top of the box.

The bottle used is a 500 cc. salt-mouth bottle 7½″ high and 2¾″ outside diameter. It is sterilized by hot air. The mouth of the bottle is protected by a piece of sterile aluminum foil covered by a piece of muslin which fits over the stopper and is tied down around the neck of the bottle. The ends of the strings are sealed over the top of the bottle to make sure that the bottle has not been tampered with after it was sterilized.

The bottle of water is slipped into a galvanized cylinder 4″ in diameter by 9″ high which is furnished with a slip cover. This cylinder is of such size that it cannot fall over in the box. Its purpose is, of course, to protect the bottle from breakage and from the water produced by melting ice.

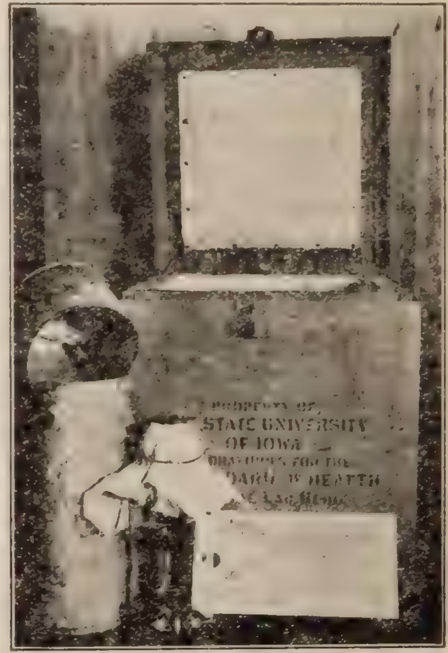

Fig. 3.—The New Container.

The sterile bottle in the cylinder is packed in excelsior when the outfit is shipped out. Some of the excelsior is removed and ice is added to the packing when the sample of water is forwarded to us. If about ten pounds of ice is used, some of it is usually unmelted when we open the container at the laboratory.

DEDUCTIONS BASED ON EXAMINATIONS OF BOTH ICED AND UNICED SPECIMENS OF WATER.

1. The temperature of the water kept in the containers just described falls slightly during the first 24 hours, but has become considerably increased by the end of 48 hours.

2. The number of bacteria tends to become slightly diminished during the first 24 hours as determined by counts of plates kept at both 20° C. and at 37° C. By the end of 48 hours, however, the number has become considerably increased.

3. The presence of red colonies on litmus-lactose plates, or of gas-production in lactose broth, is not materially influenced either by the icing of the specimen of water or by the length of time which has elapsed after the water has been collected that the examinations are begun.

CONCLUSIONS.

1. Water to be sent to a distant laboratory to be examined bacteriologically should preferably be packed in sufficient ice to prevent an increase in the number of bacteria before the time of examination.

2. The water container herein described for the sending of one iced sample for both chemical and bacteriological examination will prevent an increase of the temperature of the water to be examined for at least 24 hours and therefore meets the requirements of a water container for a state laboratory where the distance of shipment is not over three hundred miles and where the shipping facilities are such that the specimen can be delivered to the laboratory within 24 hours of the time of collection.

3. The bacteriological examination of water sent uniced in large (one-gallon) sterile containers may be regarded as "safe" if the water seems to be "safe" as determined by the sanitary survey and the chemical examination and if the bacteriological findings are properly interpreted in view of the changes which may occur in water kept under such conditions, and accordingly come within the following provisions:

(a) The number of bacteria on agar plates at 20° C. does not exceed 200 per cc. if plated within 24 hours after the time of collection, or 500 if not plated until 48 or 72 hours after collection.

(b) The number of bacteria on litmus-lactose plates at 37° C. does not exceed 50 per cc. if plated within 24 hours after collection, or 100, if not plated until 48 hours after collection.

(c) There is an absence of colonies of acid-producing bacteria which are also gas-producers.

4. The total number of bacteria in uniced specimens of water which are (or probably are) polluted with sewage material, as determined by both a sanitary survey and a chemical analysis, is so high that it is not as safe to establish limits of bacterial counts, as in case of water that would be regarded as safe by a sanitary survey and a chemical analysis.

5. Specimens of iced water which

are not plated until after most or all of the ice has melted or, with the use of the container described in this paper, until after 24 hours after such specimens are collected, should be subject to the interpretation of the findings of uniced specimens of water except of course that the time when the temperature began to increase should be regarded as the time of collection.

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COMPARABILITY—THE WILL-O'-THE-WISP OF CAUSE OF DEATH STATISTICS?

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IT IS desired to call attention to the fact that the caption of this paper is an interrogation; it is just as earnestly desired to emphasize the fact that the subject discussed is a restricted one. The writer does not wish to convey the impression that he does not believe in the comparability of the published general death-rates of the Registration Area and its main subdivisions. It is intended to limit the discussion to the death-rates for the various diseases and causes of death and to raise the question as to the comparability of a very large proportion of them—that is of their value as indices of variations in the actual death-rates during long periods of years. Do these rates approximate what has actually happened, or do they merely picture the varying trustworthiness of the reports of causes of death?

The writer's experience of over seventeen years in the work of editing and translating into cold figures the reports of diseases and causes of death by physicians, coroners, and other informants has brought him into more or less intimate touch with many of our foremost vital statisticians and public health workers. As many of these gentlemen use the published death-rates for most diseases as indices of the approximate mortality due to those diseases during long periods of years, it is principally to these men that it is desired to put the following questions: First, are these figures comparable or even approximately comparable? Second, will they ever be even approximately comparable? It is his great respect for the ability and honesty of those of his associates in mortality statistics work, who more or less frequently use these death-rates as the bases for important conclusions, that the writer is asking them these *questions,* and is *declaring* nothing beyond some of his own personal views based on his own personal experience.

For convenience the rates quoted

later will be those of the Registration Area. This, of course, is not a constant area. The matter of its varying make-up, however, is mentioned here, not because it is desired to use it as an argument in connection with the comparability of the death-rates, but to lay stress upon the fact that it is intended to disregard this part of the situation entirely. It is the sincere belief of the writer that his conclusions as to the comparability of the published death-rates for various diseases are just as well founded with relation to a constant area (the registration states of 1900, for example) as they would be for one in which the included territory has changed almost from year to year. Neither is it desired to discuss the factor of immigration, and its effect upon the proportion of the various race stocks; of changing age and sex distribution of populations; or of other considerations which indicate that the rates for the population of any given area 10 years ago are rates which apply to a population different in many respects from that of the present time. We can face the situation better and discuss it to greater advantage by forgetting, for the present, that the factors just mentioned affect the comparability of published death-rates.

It is not intended to discuss, at length, the history of mortality statistics—and more particularly of statistics of the various diseases and causes of death in this country.

It is not intended to discuss, technically, the changes in classification standards and methods which, as any vital statistician must know, have affected and will continue to affect the comparability of statistics of death from the various diseases for many years to come. Still, the first reason why many of the published death-rates for years prior to 1900 are not comparable with those for that year and subsequent years is that the classification then in use was essentially different from the International Classification, under the first revision of which our statistics of cause of death were compiled for the decade 1900–1909, and the second revision of which is our present authority. Again, the Census Bureau, in its annual reports, specifically warns against attempts to compare death-rates for certain diseases and groups of diseases for years of the period 1900–1909 with those for years of the present decade. Nevertheless, it is by no means unusual for careless or incompetent analysts to disregard these admonitions and to make the most remarkable deductions concerning the mortality from certain diseases throughout long periods of years. These deductions, unfortunately, the uninitiated, and the lay press are apt to take seriously. We need only refer to the published statements that have appeared in the annual census mortality reports since 1910 for examples of a score or more of diseases, disease groups, or "titles" of the International List concerning which we are warned that the published rates are not comparable for years prior to and subsequent to the second revision of the classification in 1909.

The effect of the factor of classification changes on the comparability of the published death-rates of one period with those of others is, in the opinion of the writer, so evident, that no one familiar with the changing methods will attempt to controvert it. If, under a given title heading in 1900, we assign all deaths reported from A, B, C, and D, and proceed to tabulate the combined mortality of the four as a total, with no statistical segregation of the mortality reported from each, and if in 1910 we tabulate under the same title heading only A, B, and C, and place D under a second heading, with no statistical segregation of the number of deaths reported from it, is it not quite evident that the death-rates for 1900 and 1910 for both title headings are not comparable? Is the situation not complicated further, if other changes of terms tabulated under these same headings are made?

Classification revision is, then, a considerable factor in its effect on the comparability of death-rates for many causes. But, withal, it is submitted that it is a minor factor compared with others which are in evidence. The careful and the initiated analyst knows the pitfalls here and will not attempt the more involved comparisons—at least he will make due allowance for the deficiencies of his basic data and will qualify his conclusions accordingly.

We now come to what seems to be the real, insurmountable obstacle. As late as 1904 causes of death were classified by the Bureau of the Census practically as reported. Beginning with 1905 the first real efforts were made to "go behind the returns." That is, to a very limited extent, efforts were made to obtain additional data in cases where statements on the transcripts of death certificates gave particularly incomplete information. These efforts were confined, at first, to a few of the worst deficiencies. The reports covering violent deaths were among the worst received in those days. Here is an example of the procedure: *Some* of the returns of "fracture" were not immediately classified (as before) under the International List title, the caption of which is "fractures." Lists of such cases, together with a number of other indefinite reports of violent deaths, were sent by the Bureau of the Census to state and municipal registration offices with the request that more specific information be secured. As a result, the totals of fatal mining accidents, machinery accidents, homicides, and vehicular accidents began to increase, as well as those of other titles relating to specifically defined violence. Some of the other reports which these lists sent to registration offices contained were "poisoning," "carbolic acid poisoning," "asphyxia by gas," "drowning," "gun shot wound," "cut," "accident," "accidental wound," "concussion of brain," and several others. The effect of this was the addition of many deaths to the homicide and suicide totals. During the first four years in which these lists were sent out, it was not possible to cover more than a small portion of the indefinite reports received. Nevertheless, the few that were sent out changed the published death-rates very materially, and this propaganda of the Census Bureau is largely responsible for the higher death-rates which now appear for homicides and suicides as compared with those of the earlier years of the first decade of the century. Returns of "operation," "surgical shock," etc., were transferred to the totals for appendicitis, hernia, gall stones, cancer, diseases of the prostate gland, uterine tumor, ovarian tumor, and other titles.

But, in our study of the effect of this propaganda on the comparability of the published death-rates, let us not lose sight of this important fact. As the years went by the vigilance of the Census Bureau increased. Year after year these lists of unsatisfactory reports became longer as more of the indefinite reports were queried. The constantly increasing persistence with which the Census Bureau insisted on more accurate basic data has unquestionably been instrumental in securing, year after year, higher proportions of accurate basic data.

Then, if the writer's recollection is correct, came the time when the effect of this campaign began to be visible in a gradually decreasing proportion of such returns from many of the older registration states and cities. Some of them, at least, began campaigns of their own to improve the quality of the returns; others prosecuted with greater vigor campaigns already instituted. The effect of this work was perfectly evident to the Census Bureau, and in the text of several of its annual reports it has not hesitated to call attention to the obvious influence of this progaganda upon certain published death-rates. Can we then seriously question the statement that the published death-rates computed on the basis of the returns as received *before* these efforts were made, must be compared with many reservations, if at all, with those of the later and more enlightened day?

Lest the accusation be made that the writer is merely generalizing, it becomes necessary to give a few examples of cases in which the published death-rates do not represent, in his opinion, the actual trend of the mortality.

Let us take the case of measles. This is an epidemic disease in which there are frequent and sharp fluctuations in the mortality. The mortality for this disease is always understated, but this understatement obtained to a much greater degree in the earlier than in the later years. It is believed that comparisons of the death-rates of two or three recent consecutive years give, as a rule, a fairly good picture of what changes have taken place. But when one attempts to compare the apparent death-rate from this disease for the year 1900 with that for 1910 or 1915, there is another story. According to the Census Mortality Reports for 1915 the published death-rate for this disease was increased for that year more than 7 per cent. by the addition of 242 deaths, of which 94 per cent., on the basis of the original reports, would have been charged to bronchopneumonia or to "pneumonia." These deaths were finally charged to measles because the physicians, in answer to Census inquiries, stated that measles was the primary cause. It is safe to say that a large and yearly increasing number of deaths, beside these, have been classified under measles in the past ten or twelve years as, more and more, physicians have come to realize the importance of stating the primary cause on the certificates, as well as mere complicating or terminal symptoms.

For reasons similar to those which obtain with respect to measles it is contended that, to a very considerable degree, the same changes are operative in their effect on the comparability of the published death-rates for whooping-cough and influenza. Information obtained from letters of inquiry to the physicians, in conjunction with increased precision of original statements of cause of death, have raised materially the published death-rates for such titles as tuberculous meningitis, syphilis, gonococcus infection, alcoholism, epidemic cerebrospinal meningitis, diseases of the ears, puerperal albuminuria and convulsions, puerperal septicemia, infantile diarrhea, injuries at birth, lack of care, and excessive cold. They have reduced very considerably the published totals for such titles or subtitles as septicemia, simple meningitis, paralysis without specified cause, convulsions, pneumonia, pleurisy, pulmonary congestion, simple peritonitis, acute nephritis, congenital debility and others. One needs only to look at the text comments on the accuracy of mortality statistics in the more recent annual Census mortality reports to find more detailed information about these changes.

But let us take up the practical task of trying to picture, by means of the published death-rates alone, what has happened in the mortality from a number of causes of death.

A great deal gets into print about the decreasing death-rate from tuberculosis. A bright picture is painted. As a matter of fact the story told by the published death-rates is *by no means bright enough*, for there has been a greater decrease in the mortality from tuberculosis than the figures indicate. But this is their story: In the year 1900 the death-rate for tuberculosis in the Registration Area was 201.9 per 100,000 population. With a few minor exceptions a continuous decrease is shown, year after year, until we read that for 1915, the latest year for which the rate is now available, the mortality had decreased to 145.8, a fall of 28 per cent. Closer analysis, however, discloses that despite the fact that during these years, to an increasing extent yearly, there has been a tendency to report the tuberculosis on death certificates—*despite* this fact, the published rate has continuously decreased. If there had been the same percentage of accurate statement in the early years that there has been in the later ones, it is safe to say that the rates shown for those earlier years would have been much higher, and in consequence, the percentage of decrease shown by comparison of the published rates of 1900, 1905, and 1910, with those of 1915 would have been considerably greater and much more representative of the real decrease in tuberculosis mortality than are the figures as they stand. Let us look at the decreasing totals for diseases under the names of which deaths from tuberculosis are often concealed. Under the first of these, "hemorrhage," it is true, only a comparatively small number of deaths are classified. Nevertheless, the apparent death-rate from this cause has declined from 4.3 in 1900 to .4 in 1915. This means, that the mortality charged to it is only a little more than one eleventh of what it used to be. In 1900, 1,324 deaths were charged to this cause; in 1915 there were only 293. It is safe to say that many of these which now go into the tuberculosis column would have been classified in former years, as deaths due to "hemorrhage." A more important factor, numerically, is chronic bronchitis, for which there has been an almost continuous decline in the published death-rate from 1900 to 1915. In the first of these years the published mortality for this disease was 19.3, whereas in 1915 it had been reduced to 7.7. Unquestionably, we have here the explanation for the classification of a great many deaths under the tuberculosis total, which under former conditions, would not have been so assigned. Here a much larger number of deaths is involved than in the case of "hemorrhage." The published death-rate for pleurisy was 4.7 in 1900 and 3.4 in 1915. That for "pulmonary congestion" declined steadily throughout the period from a maximum of 11.4 in its first year to a minimum of 2.4 in its last. Similarly, there has been quite a steady and consistent decline in the death-rate from the residual title known as "other diseases of the respiratory system." Under each of these there can be no question but what deaths that were really due to tuberculosis were concealed to a much greater degree in the earlier than in the later years. There can also be little doubt but what the immense reduction in the published total for "ill-defined diseases" has been responsible for the addition of many deaths to the tuberculosis total. Despite all these factors, each and every one of which should raise the rate, the published death-rate has declined, and there is every reason to believe that the decrease has been considerably greater than the figures indicate.

We may pass very briefly the very considerable increases shown in the published death-rates for syphilis and gonococcus infection. These indicate that there has been an increase of approximately 150 per cent. in the former and 400 per cent. in the latter, since 1900. Does any one question the statement that the figures in these cases are not true pictures, nor are they approximate pictures, of the degree of change in conditions.

We next come to the rates for cancer and other malignant tumors, for which the published death-rates show a practically continuous increase throughout the period 1900 to 1915. The indicated increase here is from a death-rate of 63 per 100,000 population in 1900 to 81.1 in 1915, or 29 per cent. It is the firm opinion of the writer, that while there has been actually an increase in the cancer rate in Registration Area and in the United States, it is by no means as great as these figures indicate. In few diseases has the Census Bureau's educational propaganda brought about increased precision of statement of the cause of death to the extent that has obtained for deaths due to cancer. Again, if the returns of earlier days had been as carefully scrutinized as those of later years, the cancer death-rates for those earlier days would have been much higher than those which are in evidence, and the percentage of apparent increase much smaller. Many deaths now go into the cancer total which in earlier days would have been classified as "tumors," under "simple peritonitis," and under the total of "ill-defined diseases." In recent years it has been quite a usual experience to return for further information cases where death is reported as due to such causes as "disease of the stomach," "disease of the pharynx," "disease of the intestines," and of other organs, with the result that additional information has been furnished to the effect that the real cause was *malignant* disease. Thus, the deaths were changed from these various totals to the cancer total. An investigation of this subject by the Statistical Bureau of the Metropolitan Life Insurance Company during the period 1911 to 1916 showed, that with the exception of the last year, there was a tendency toward a *slight* increase in the cancer mortality among its industrial policyholders. The Metropolitan began its study of the mortality of its industrial policyholders in 1912, although the first year to which the study relates is 1911. It began its study, however, after it had been very clearly demonstrated that it is a paying procedure to investigate very carefully the indefinite returns, and as this policy was followed throughout the period covered by its investigations, and as there has been no revision of the classification during the period to which they relate, it is believed that the rates for these six years are fairly comparable. There has been no such increase in the mortality from cancer among Metropolitan industrial policyholders as is indicated for the Registration Area by the published returns of the Census Bureau, and for 1916 as compared with 1915, there was actually in evidence a slight *decrease* in the death-rate.

The Census figures show that between 1900 and 1915 there was a seeming increase in the mortality from apoplexy of 17.5 per cent. For the same period they show for "paralysis without specified cause" a decrease of 65.3 per cent. We, who have read the replies of thousands of physicians to query letters about "paralysis," have had tangible evidence of one reason why the "paralysis" rate appears to be declining, and the apoplexy rate appears to be rising.

The figures for some of the numerically less important diseases afford excellent examples of what a handicap confronts the man who takes the published death-rates at their face value without knowledge or consideration of the circumstances under which they were compiled. For example, there have been no important changes, since 1900, through revision of the classification, in the list of diseases tabulated under the heading of "diseases of the ears." Nevertheless, the apparent death-rate, showing year after year, an almost continuous increase, was in 1915 a little more than triple that of 1900. It will hardly be contended that there has been an actual increase in the fatal cases of ear disease to the extent indicated. Here is what has happened. Hundreds of physicians who, in 1900, would have certified or did certify fatal cases of otitis media as due to the terminal condition, meningitis, have been, under the stimulus of educational propaganda, returning such cases in more recent years under the primary cause.

Without going into reasons in each case, it is the opinion of the writer that the published death-rates covering periods of years for all of the following titles are either utterly noncomparable, or need much more or less technical explanation, if used to illustrate the trend of mortality from these causes: Malaria, measles, scarlet fever, whooping-cough, influenza, dysentery, pellagra, all tuberculous diseases, syphilis, gonococcus infection, cancers, "tumors," acute rheumatism, chronic rheumatism, "other general diseases," alcoholism, encephalitis, meningitis, locomotor ataxia, "other diseases of the spinal cord," cerebral hemorrhage, softening of the brain, "paralysis without specified cause," general paralysis of the insane, "other forms of mental alienation," convulsions, "other diseases of the nervous system," diseases of the ears, acute endocarditis, the very important title *organic diseases of the heart*, diseases of the arteries, "hemorrhage," acute bronchitis, chronic bronchitis, bronchopneumonia, pneumonia, pleurisy, pulmonary congestion, asthma, "other diseases of the respiratory system," ulcer of the stomach, "other diseases of the stomach," appendicitis, hernia, cirrhosis of the liver, biliary calculi, simple peritonitis, acute nephritis, diseases of the bladder, diseases of the prostate, uterine hemorrhage, the entire class and practically every title included under Group VII—The Puerperal State, gangrene, congenital malformations of the heart, all of the titles listed under Class XI—Early Infancy,—senility, a considerable number of those listed under Group XIII—External Causes, particularly traumatism by firearms, and by cutting or piercing instruments; also a number of other titles, the deaths from which have been classified, more and more as the years have passed, under the homicide total rather than under accidental deaths. This emphasizes the noncomparability of the group of death-rates relating to homicide. There is hardly a title under the External Cause class, for which the death-rates are comparable for a series of years, and such comparisons should be made only with extreme caution and with knowledge of the factors which influenced their compilation.

We finally come to the great group under the head of "ill-defined diseases" which, from 1901 to 1905, included about 3 per cent. of the total number of deaths. For the year 1915 the deaths included under this group amounted to only about four-fifths of 1 per cent. of the total. The deaths representing the difference between these rates, and which in earlier days went into this ill-defined class, have, in increasing degree throughout the years, gone into other totals, thus affecting the comparability of these.

It is suggested—merely suggested—that diagnostic acumen is having its effect, more and more each year, on the comparability of the death-rates for various diseases. If this is so, and if certain diseases are more often correctly diagnosed now than heretofore, no comment is needed on the effect of this factor on the published rates for such diseases; also on those under which the deaths caused by them were classified in earlier years through mistaken diagnoses.

It has been suggested to the writer in verbal discussion of this question of the comparability of death-rates, that it is probable that the errors involved are approximately compensating, and that, on account of the large number of cases involved, the death-rates for each disease give a fairly accurate picture of the trend of the mortality from that disease in accordance with what is known as the "law of large numbers," "law of averages" or "law of error." This viewpoint can not be successfully supported so far as the apparent death-rates for diseases are concerned. The reason is obvious: the basic data are not equally amenable to misstatement. If we tabulate one million deaths by sex, it may be presumed that mistakes in classifying deaths of males as females and of females as males will be approximately compensating. It will hardly be maintained, however, that physicians will misstate as many cases of actual puerperal hemorrhage merely as "hemorrhage" as they will misstate cases of "hemorrhage" as puerperal hemorrhage. Unless all efforts to improve the descriptions of causes of death have failed, it is obvious that the mortality formerly charged to the unsatisfactory and ill-defined titles is becoming, more and more, a part of the totals charged to the definite and satisfactory titles.

Is it not evident then, that when we seek to compare the more or less remote past with the present or immediate past, the admitted growing accuracy of the figures is evidence, in itself, that they are not comparable. The loss of comparability of death-rates of causes of death is the price that we must pay for the educational efforts which make for better statistics. No one who is at all informed disputes the assertion that figures of equal reliability are more comparable than those of unequal reliability. No one who has worked actively in this field disputes the improvement of our basic data. The only question is the *extent* to which comparability is affected and for what diseases and causes of death the rates are not comparable. It is believed that we can now safely state that, chiefly through the progressive spirit shown by the Census Bureau, we are out of the one-cylinder, solid-tire stage of cause of death classification procedure. During that stage, more energy was expended in blowing the horn than in improving the machinery of locomotion. The things that were current and timely according to the standards of other days, can not be measured in terms of and according to those of the present and more recent past. Great credit for the improvement in basic cause of death data must be given to the Census Bureau. If that bureau had been less progressive and had been content to publish its cause of death data as reported, according to the standards of earlier days, we might have, today, less accurate statistics which would be comparable with those of other years, instead of statistics that are getting better and better as the years go on, but which are not so comparable, as the inevitable effect of their betterment.

For the reasons set forth, therefore, the writer believes that in very many cases the published death-rates for titles of the International List are absolutely noncomparable for extended periods of years. That is, they are noncomparable as even approximate pictures of the actual (not the reported) trend of the mortality from the diseases to which they relate. It is the further belief of the writer that with many other titles of the International List, the published death-rates give an approximate picture of the trend of the mortality only when handled by competent analysts who are familiar with the changes that have been operative during the past two decades. It is, to say the least, a grave statistical error to compare many of these rates as they are being compared today. No better example of the false impression that arises from such comparisons can be given than the contention of the Life Extension group concerning the increased mortality from degenerative diseases in the United States. While the writer is not prepared to state that there has been no increase in the mortality from degenerative diseases during the past few years, he is prepared to assert (there is no interrogation here) that a large part of the increase which they seek to prove by quoting the figures is due simply to more accurate reporting of causes of death and better "editing" of the reports, whereby the totals for organic heart disease, diseases of the arteries, and cerebral hemorrhage have been raised by tabulating under those titles deaths that previously would have been classified elsewhere.

Reverting then to the questions in the second paragraph: *one*, are these figures comparable or are they approximately comparable? and *two*, will they ever be even approximately comparable? It is the writer's opinion that many, if not the majority, of the published death-rates for the 189 titles of the International List are not comparable for long periods of years. As to the present and the future, it is the writer's belief that we are approaching the day when the majority of these death-rates may be safely compared with each other. Comparisons of consecutive years will always, in all probability, be more valid than those relating to widely separated years. There will always be classification changes. In the future when such changes affect the comparability of titles to a very marked degree, we should provide for the statistical segregation of deaths reported from those diseases which are changed from one title to another. The Registrar-General of England and Wales has set an excellent example along this line. The outlook, therefore, is not a hopeless one. The writer believes that we are truly chasing a will-o'-the-wisp in efforts to compare the present with the past, and the less remote past with the more remote past; but he also believes that, in trained and skillful hands, comparison of disease death-rates will be more and more practicable as the years go on. The ultimate effect of persistent educational propaganda and of letters to physicians will be, it is hoped, the practical elimination of indefinite reports. The careless and incompetent analyst, however, will always be the bull in the mortality statistics china shop.

It is believed that one important lesson to be learned is the necessity for all vital statistics publications to tell frankly in their text comments what rates are not comparable, and to specify the factors which affect their comparability. In all published tables in which death-rates for diseases are given for periods of years, those for which the rates are not comparable should be indicated typographically. This has been done, for some of these titles, in the Census Mortality Reports since 1910.

With the situation as it stands, we should not view with alarm any well considered effort to perfect our classification system, simply because such effort will make our results incomparable with those of past years. As a matter of fact they are incomparable often enough now. If the International List of Causes of Death needs revision in any particular, let it be revised and those of the next generation will thank us. They will thank us because they, at least, may have data that will be truly comparable.

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HOUSEKEEPING AND THE PUBLIC HEALTH.

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Presented before the Sociological Section of the American Public Health Association, Washington, D. C., October 20, 1917.

THE world's tragedy has emphasized in a cruelly telling way the importance of saving human effort. In no field today is it more necessary to seek the direct way of accomplishing results and to avoid confusion in aim and method than in public health. It is perhaps not strange that many mistakes have been made in the past. The paper presented last year before the American Public Health Association by Franz Schneider, Jr.,* was a most welcome and timely caution. In discussing "Some Short-Comings of Socio-Sanitary Investigations," Mr. Schneider showed how frequently association has been taken for causation. The first topic he chose for illustration was the effect of housing on health. He gave most illuminating and interesting illustrations of "hasty generalizations dogmatically uttered that are so frequent in reports dealing with social and health conditions." Mr. Schneider performed an invaluable service in thus pointing out that the effects of bad housing must be sharply differentiated from the evil results of other conditions if we are not to waste effort or go in the wrong direction in seeking to improve the standard of health. There is a distinct need, as Mr. Schneider says, of standardized terms and methods in making housing inquiries or in planning housing legislation.

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* American Journal of Public Health, January, 1917.

My purpose is to urge one special phase of the subject which must be clearly understood if progress is to be made in standardization and if waste of effort is to be prevented. In current studies and investigations of housing there is an almost universal failure to distinguish between housing and housekeeping. In housing exhibitions, for example, one may frequently observe contrasted instances of good and of bad housing in which the difference is solely one of housekeeping, the housing itself being the same in both. Starting with the instance of so-called "bad housing," cleaning the window and letting light in, making up the bed, repairing the stove or chair, removing the clothes from the line strung across the room, clearing away tin cans and broken dishes, and we are given "good housing," although no change has been made in the room itself, and it should be perfectly clear that the methods employed in bringing about the change are not those which would assure good housing, properly speaking.

In regarding the effect of housing on health this distinction must surely be added to those suggested by Dr. Charles J. Hastings.* He asks, "How much of the misery in our back streets is due to one thing and how much to another? How much to worry? How much to dark, dusty factories? How much to improper clothing? How much to improper, insufficient, or badly cooked food? How much to general malnutrition? How much to overcrowding? How much to unsanitary privy pits? How much to drunkenness and dissipation?"

It is possible to interpret housekeeping as covering some of these points as, for example, badly cooked food, but insufficient food must be more frequently attributed to poverty or bad economic conditions. On the other hand, housekeeping covers many other points which are of significance not merely in the spread of infectious diseases but in maintaining the house and the habits of living within it in such a way as to secure the highest degree of vitality and the greatest possible freedom from mental anxiety as well as from bodily and spiritual discomfort. It is indeed in regard to these larger, or it may be said, more general aims that much so-called housing legislation is of value. The usual legal provisions in regard to lighting and overcrowding, for example, can not be shown to have direct results in and of themselves in the lessening of infectious diseases, but their enforcement may contribute toward standards of living which conduce to better health in every respect. On the other hand, there is much of this very legislation which does not in and of itself, even if enforced, secure right conditions. The size of the window, for example, may be stipulated in the ordinance, but that gives no assurance that the room will be either adequately lighted or ventilated. The proximity of another building, heavy draperies, or an accumulation of dirt may keep out the needed light, and on the other hand, the window may never be opened, in which case it may serve to lessen the amount of air renewed even more than an equal area of more pervious wall would do.

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* Transactions of National Association for the Study and Prevention of Tuberculosis, 1915.

Views in regard to the connection between house infection and the spread of tuberculosis are undergoing very radical change. Many of the factors which were formerly supposed to be important, such as sunlight, have proved to be of indirect if of any significance. Virulent bacilli were found by Dr. F. A. Craig, of the Henry Phipps Institute in 66.6 per cent. of the dirty houses which had been occupied by infected persons and in 50 per cent. of the clean houses, a difference, considering the number of houses investigated, not great enough to justify some current theories. In fact, Seymour H. Stone in a "Study of House Infection and the Spread of Tuberculosis,"* makes the following statement as his final conclusion: "We seem to have pretty conclusive evidence that infection by fresh living bacilli through droplets and direct contact is probably the source of a very large proportion of cases, percentages varying from 50 to 95 per cent. If these percentages are correct, is it not further evidence that house infection does not very often occur?" As Dr. E. R. Baldwin of Saranac Lake has said: "House infection is after all another name for contact infection." It is not necessary to give further illustrations of the inadequacy of much existing legislation unless supplemented by proper methods of living and care. It must be constantly borne in mind, of course, that bad living quarters, while seldom the primary cause of ill health, are a factor of importance in the environment of family life. In the words of the Report of the Tuberculosis Survey of the Michigan State Board of Health, "A house is not merely shelter, —it is a form of equipment, a plant with a purpose. All increase in our ideas of the necessity for correct personal and family habits increases the importance of this equipment. It enlarges the functions which the house ought to serve in the life of every family. Insistence on right personal habits will bring the home and its equipment into greater prominence."

My personal conviction is that a community would be better off if it had no housing laws, but each housekeeper maintained a high standard of hygienic housekeeping than if it had the best housing code and admirable enforcement of the laws but at the same time the housekeeper was unintelligent and shiftless. In housing and health conferences, among social workers, health experts, and laymen alike, there is, however, a general tendency to assume that laws in regard to house construction are of so great importance that further measures to secure a healthful environment are frequently neglected. It is, of course, a simple matter to place the whole responsibility upon those who make and administer the law, but it should be urged that more active and cordial support be given by public health officials to all who are trying by precept, example, and education to train housewives to do their share. I would go so far as to suggest that after opportunities for proper training in hygienic housekeeping have been provided, there might well be provision for enforcing the hygienic use of the house and its equipment.

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* *Journal of the Outdoor Life*, February, 1917.

A notable step in the direction of emphasizing the sanitary importance of housekeeping was taken recently in the publication of the little pamphlet entitled "For You," by the Tenement House Department of the City of New York and the Tenement House Committee of the Charity Organization Society, New York City, published in coöperation with the Police Department, Fire Department, Department of Health, Department of Street Cleaning, and Department of Water Supply of the City of New York. Such propaganda in behalf of the proper use of shelter may well be adopted in every community, but it is desirable to have the additional coöperation of school officials, especially teachers, women's clubs, charity organizations, and home economics societies. They would bring to the movement of better living a potential force whose influence and interest are not fully recognized by public health experts and government officials.

In conclusion, I would repeat that housing and housekeeping must be distinguished. Both are factors in the health of the community. Especially in the light of the appeal by this Association to the President of the United States to take measures to conserve the health of the civilian population, efforts should be made to standardize methods in both fields in the light of scientific knowledge and experience. As a practical measure every department of health should have in addition to its sanitary inspectors a staff of competent, well-trained visiting housekeepers who should not only give skilled instruction in hygienic housekeeping but coöperate with other agencies in maintaining decent and wholesome conditions of living.

Note. The experience of South End House, Boston, in coöperation with the Women's Municipal League is suggestive. The following statement concerning the experiment is furnished by Miss Gertrude Barrows:

A tenement situated directly opposite South Bay Union, our club house, was taken and furnished with the idea of showing the neighbors what could be done with one of their own houses, if the landlord was made to live up to his part of the agreement. We find that so many of our neighbors are afraid of the landlords that they do not dare to ask for the simplest comforts in the tenements. We persuaded our landlord to whiten the courtyard, according to a board of health regulation in this city, which of course immediately brightened up the rooms, since the tenement was on the first floor. We put no money at all into having the place cleansed and painted, but required him to do it before we moved in. He later became interested, and painted the halls and stairs, which benefited the tenants of the other floors. He also cleaned the cellar, mended the coal bins, and put locks on all four of them, so that the tenants ceased to lose their fuel, as they had in the past.

The tenement was furnished very simply, and all the prices marked plainly on everything to show what could be done by paying cash instead of buying on the instalment plan. In every room the board of health regulations which could any way apply to that house were posted, and we felt that the neighbors learned a great deal from this, especially since we always had some one at home there in the afternoon to talk over with them the application and relation of our problems and successes with our landlord to their own.

The tenants upstairs became interested, and the people soon asked if they might use the rooms for meetings, which of course gave the tenement a larger influence at once. The whole house took on a different aspect, and one tenant moved because she said she "could not keep up to the pace." This was considered a real fall on her part by the people in her neighborhood, and she has never really been reinstated socially because of it.

The landlord has acquired two other houses, and remodeled them, and he frankly admits that he has been influenced in his ideas by what he learned from having us as tenants.

The tenement was not "given up" in one sense, but after three years was moved on to another part of the city. We felt that it had taught a real lesson here.

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THE SPECIFICITY OF DISINFECTANTS AND ITS BEARING ON THEIR STANDARDIZATION.

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Read before the Laboratory Section, American Public Health Association, October 20, 1917, at Washington, D. C.

THE standardization of disinfectants has been an annual subject of discussion before health congresses and societies since the advocation of the "drop method" proposed in 1903 by Rideal and Walker. During these years many refinements, changes and additions have been made to this method, the latest being the control of the acidity of the media by determining the H-ion concentration. There is no doubt that the method has been improved but the question arises has not the broad purpose of the test been overlooked in searching out the details.

There was a time when with limited bacteriological knowledge, it was reasonable to suppose that all disinfectants would bear the same germicidal relation to phenol, no matter on what organism tested. This time has now passed and when a label bears the statement that a certain preparation has a phenol coefficient of 2, it cannot be taken literally, but must be interpreted in the light of the method used in determining this coefficient. If this method is that of the hygienic laboratory, it means that this preparation under the conditions of that test is twice as germicidal as phenol *on the bacillus typhosus, or a particular strain thereof.* No conclusions should be drawn as to its germicidal action on the staphylococcus, streptococcus or any other organism, not excepting the bacillus coli, or paratyphosus. Naturally the closer the chemical relation between the disinfectant and phenol, and the closer the bacteriological relation of the organisms concerned in the comparison, the more nearly correct will be any conclusion drawn from such a test. On the other hand, it is only rational to suppose that disinfecting agents of widely different character will vary greatly in their germicidal relation to phenol when tested on organisms of different genera or species. Since the advent of synthetic dyes in preparing differential culture media and later the production of diarseno-benzol, the specificity of drugs for certain microörganisms should not be lost sight of. Chick and Martin (1) recognize this specificity of disinfectants when they say, "Some disinfectants are more efficient against a particular organism than against any other." Churchman's (2) work was quite definite in showing the selective affinity of gentian violet for certain organisms. In the main he could divide bacteria into two classes, those which were inhibited in their growth by very weak dilutions of this dye and those which were unaffected by even much stronger solutions. As a rule closely related bacteria reacted similarly to gentian violet but he found a marked exception to this in one strain of B. enteritidis. This strain was indistinguishable by ordinary cultural and staining methods from four other strains of B. enteritidis, yet it was completely inhibited by weak dilutions (1:80,000) of gentian violet, whereas the other four were not. Churchman states that this instance is significant because it establishes the fact that chemical substances may be so specific in their selective affinity for microörganisms as to distinguish among strains of bacteria otherwise indistinguishable; and further that it indicates to what extent our ideas of bactericides must be modified by the conception of chemical affinity, and that the fact that a given bactericide kills a given organism does not justify the conclusion that it will kill all closely related organisms, or even all strains of the same organism.

Browning and Gilmour (3) examined a number of organic and inorganic compounds for their bactericidal action toward different species of bacteria, with a view to discovering—(a) substances possessing specific bactericidal properties for particular organisms and—(b) relationships between chemical constitution and bactericidal action. They found staphylococcus aureus and B. anthracis, organisms more resistant to phenol than is B. typhosus, less resistant than the coli-typhoid group of organisms to the action of certain basic benzol derivatives among which may be mentioned fuchsin, hexamethyl violet, methyl-green, malachite-green and brilliant green. The amount of hexamethyl violet required to inhibit B. typhosus was 150 times that required for staphylococcus aureus. Furthermore these authors state that whereas the action of malachite green shows no marked difference between its effect on B. typhosus and B. coli, brilliant-green exerts a more marked bactericidal action on B. coli than on B. typhosus. In other words, the bactericidal action of a disinfectant on one organism is not necessarily a measure of its action on another, even when these organisms belong to the same genus or closely related group.

Another very interesting feature of Browning and Gilmour's work is that they found the presence of serum to increase the antiseptic action of flavine for both staphylococcus and B. typhosus. This is certainly contrary to the action of serum on the effect of any other class of disinfectants and should be taken into consideration when giving them a valuation or phenol coefficient.

Flavine is an example of a valuable disinfectant which if gauged by its phenol-coefficient would be practically worthless. Pine oil, on the contrary, is an example of one which, based on its phenol coefficient, should be of considerable importance, but which in practice is deficient in some respects as a general disinfectant. This deficiency was brought to my attention after the issuance of the hygienic laboratory's report (4) on pine oil as an efficient liquid disinfectant when I was asked by a dentist how long a time would be required to sterilize instruments in this Pine Oil Disinfectant. The Pine Oil Disinfectant was made by incorporating 62.5 per cent. of pine oil in soap according to the directions for making the "Hygienic Laboratory Pine Oil Disinfectant." The phenol coefficient of this solution was determined and found to be 3.8. Several different samples of pine oil purchased on the open market varied in their phenol coefficient. This variability of pine oil was mentioned by Hamilton (5) before this association last year.

In testing the ability of this Pine Oil Disinfectant to sterilize dental or other instruments, small steel blades (scarifiers), ½ x 3½ centimeters were contaminated with various organisms and subjected to the action of the dis-

TABLE I.

CULTURES OF STAPHYLOCOCCUS AUREUS—DRIED.

RECENTLY ISOLATED CULTURES.

Time	2% pine oil disinfectant	4% pine oil disinfectant	5% phenol	Water control
5 minutes	+ + +	+ + −	+ − −	+ + +
10 minutes	+ + +	+ + +	− − −	+ + +
15 minutes	+ + +	+ + +	− − −	+ + +
30 minutes	+ + −	+ + +	− − −	+ + −
1 hour	+ + −	+ + −	− − −	+ + +
3 hours	− − −	− − −	− − −	+ + +
20 hours	− − −	− − −	− − −	+ + +
OLD STOCK CULTURES.				
5 minutes	+ + +	+ + +	− − +	+ + +
10 minutes	+ + +	+ + +	+ + −	+ + +
15 minutes	+ + +	+ + +	− − +	+ + +
30 minutes	+ + +	+ + +	− − +	+ + +
1 hour	− − +	+ + −	− − −	+ + +
3 hours	− − −	+ + −	− − −	+ + +
20 hours	− − −	− − −	− − −	+ + +

infectant, using phenol as a control, in the following manner:

EXPERIMENT I.

Twenty-four hour broth cultures of recently isolated and old stock cultures of staphylococcus aureus were each used to inoculate 84 metal scarifiers. Both lots were placed in sterile petri-dishes to dry over night.

With sterile distilled water, 2 per cent. and 4 per cent. emulsions of Pine Oil Disinfectant and 5 per cent. solution of phenol were made. Sterile distilled water was used as control. Five per cent. phenol was taken because it is the strength commonly used in sterilizing instruments.

The scarifiers were placed in the above solutions and also in sterile water as a control, 21 in each, and allowed to remain for periods of 5–10–15–30 minutes, 1 hour, 3 hours, and over night. Those placed in the Pine Oil Disinfectant were removed, 3 at the end of each period of time, washed in sterile water and placed in fermentation tubes of broth.

Those in 5 per cent. phenol were removed and washed in 95 per cent. alcohol before placing in fermentation tubes. Those in sterile water were placed directly in fermentation tubes without washing.

After 24 hours' incubation, transplants were made from the fermentation tubes to agar slants. The results are given in Table I in which the plus sign indicates growth of the organisms. The three columns following each interval of time represent the three scarifiers used in each solution.

By the hygienic laboratory method of testing disinfectants, Pine Oil Disinfectant would be classed as having 4 times the germicidal power of phenol.

TABLE II.

CULTURES OF STAPHYLOCOCCUS AUREUS—NOT DRIED.

RECENTLY ISOLATED CULTURES.

Time	2% pine oil disinfectant	4% pine oil disinfectant	5% phenol	Water control
5 minutes	+ + +	+ + +	− − −	+ + +
10 minutes	+ + +	+ + +	− − −	+ + +
15 minutes	+ + +	+ + −	− − −	+ + +
30 minutes	+ + +	+ − −	− − −	+ + +
1 hour	+ + −	+ + −	− − −	+ + −
3 hours	+ − −	− − −	− − −	+ + +
18 hours	− − −	− − −	− − −	+ + +

OLD STOCK CULTURES.

Time	2% pine oil disinfectant	4% pine oil disinfectant	5% phenol	Water control
5 minutes	+ + +	+ + +	+ − −	+ + +
10 minutes	+ + +	+ + −	− − −	+ + +
15 minutes	+ + +	+ + −	+ − −	+ + +
30 minutes	+ + +	+ + +	− − −	+ + +
1 hour	+ − −	− − −	− − −	+ + +
3 hours	− − −	− − −	− − −	+ + +
18 hours	− − −	− − −	− − −	+ + +

From the above experiment in which staphylococci were used as test organisms, Pine Oil Disinfectant, 2 per cent. or even 4 per cent. does not destroy the organisms in one hour; whereas they are usually killed by 5 per cent. phenol within 15 minutes. Another striking point brought out in Table I is that Pine Oil Disinfectant, 4 per cent., is no more effective than the 2 per cent. dilution.

In order to check these results a second series was carried out differing from the former only in that the inoculated scarifiers were not dried before placing them in the disinfectant solutions and that the fermentation tubes were incubated 48 hours before transplants were made from them.

These results confirm those of Experiment I, and again show that Pine Oil Disinfectant diluted with water to make a 4 per cent. mixture or emulsion is little, if any, more effective than the 2 per cent. emulsion.

Other similar tests were made using B. typhosus, streptococcus pyogenes, and B. diphtheria and showed that in practically all instances the test organisms were killed within 15 minutes by the disinfectants employed; and that of the four bacteria used in the experiments, the staphylococcus alone stood out as being disproportionately resistant to pine oil solutions in soap.

Pine oil cannot, then, be termed a general disinfectant of high germicidal value, for although showing to advantage when tested on the typhoid bacillus, it is much less efficient than phenol or cresol when the infecting organism is the staphylococcus aureus. This is another instance of the fallacy of the present generally accepted method of determining the value of disinfectants, namely, the so-called hygienic laboratory method. The physician or dentist who does not know the intricacies or inaccuracies of the present methods of testing or standardizing disinfectants is justified in thinking that a phenol coefficient of 4 means that the preparation is four times as active as phenol, and that a 1 or 2 per cent. solution of it will sterilize his instruments within 5 or 10 minutes. He is further justified in reposing confidence in the phenol coefficient of a disinfectant because the method of determining this is sanctioned by the government and by the Council on Pharmacy and Chemistry of the American Medical Association. One state requires that disinfectants must have the phenol coefficient on the label, and before a disinfectant will be admitted to New and Non-Official Remedies, this same condition must be complied with. Defects of this method have been repeatedly pointed out, but have been apparently disregarded by its advocates and entirely overlooked by others interested in having it made a legal method for standardizing disinfectants. Hamilton and Ohno (6) have shown that this method in different hands gives widely varying results when testing the same disinfectant on the same strain of typhoid organism. If comparable results cannot be obtained when the same organism is used, one would certainly expect a disinfectant to vary widely in germicidal power when tested on different organisms. In fact, Anderson and McClintic, the originators of the Hygienic Laboratory Method, say (7) "Unless different observers use the same species of organism, there can be no possibility of uniformity in results. The coefficient obtained with different species may vary as much as 300 per cent." If this be the case, what is the practical value of the phenol coefficient as determined by the Hygienic Laboratory Method? Certainly only a small proportion of any commercial disinfectant is employed to destroy typhoid bacilli.

In the case of pine oil, we have an agent considerably more germicidal than phenol when acting on the typhoid bacillus, and very much less active then phenol on the staphylococcus. This proves conclusively that the comparative disinfectant value of pine oil and phenol cannot be determined by any one test.

Other defects in the Hygienic Laboratory Method have been pointed out. Duyser and Lewis (8) call attention to three factors which cause unreliable results. As stated they are "(a) The use of an excessive number of bacteria depletes the disinfecting solution before the culture is rendered sterile. (b) An unknown volume is withdrawn for testing, in that the volume of the standard loop is not constant. (c) It is impossible to determine from the broth tube inoculated, how complete the killing was at the time the sample was withdrawn." Duyser and Lewis showed that the so-called standard loop, which is supposed to transfer a constant amount of culture from a tube or flask to the disinfectant, varies under the best conditions at least 30 per cent. from the average, and when not very carefully used may vary as much as 80 per cent. This inaccuracy of the standard loop was verified by A. D. St. John (9) who was able to obtain with the same loop a variation of 300 per cent. by slowly withdrawing the loop edgewise and quickly withdrawing it parallel with the surface. The lack of uniformity of different loops in the hands of different bacteriologists can readily be appreciated.

So that, as a matter of fact, the stating of the phenol coefficient on a label may be misleading and, instead of informing the public as to the value of any particular agent, may misinform and give a false sense of security. At the same time it would afford ample opportunity for litigation and a wide difference of opinion among experts.

The value of any method of testing disinfectants has been well stated by Phelps (10), "The results of any disinfection experiments are fundamentally influenced by such conditions as temperature, character of the organism employed, number of organisms in unit volume, and character of the medium. In the absence of complete data covering these points results are practically worthless, at least for purposes of comparison. Even with such data given, it is still impossible owing to the variable conditions obtaining in practice, to establish any relationship, or order of excellence, among the various disinfectants. At best we can only hope to establish such relationship under specified experimental conditions." He further says "It seems at present to be quite necessary to determine the relative germicidal values of two disinfectants upon the actual kind of germ upon which they are to be employed and to qualify the final comparative results accordingly." In no case has the practical value of this dictum been so clearly exemplified as in the present investigation. Based on the report of Stevenson from the Hygienic Laboratory entitled "An Efficient Liquid Disinfectant," one would be led to think that "Pine Oil Disinfectant" is 4 to 6 times as effective a germicide as phenol, without any exceptions. That this is not the case has been clearly shown by the preceding experiments and contrary to the statement in the above report, Pine Oil Disinfectant cannot be satisfactorily used to replace the ordinary coal tar compounds commonly employed as disinfectants.

There is another phase of the question brought up by these discrepancies, namely, legalizing the Hygienic Laboratory Method as a standard method under which prosecutions may take place. That this is not desirable is readily understood when the inaccuracy of the method is considered. Almost every factor concerned is variable and is difficult or impossible to control. The temperature, the media, the number of bacteria used, the change in resistance of the organisms, and the technique are some of these factors already mentioned. These have been well discussed in the paper of J. T. Ainslee Walker (11).

Aside from these considerations, the true value of a disinfectant can only be stated in terms of the organism or organisms on which it is to be used in actual practice. To state that Pine Oil Disinfectant is "an efficient liquid disinfectant" which "may be used wherever the ordinary coal tar compounds are used" is certainly drawing erroneous conclusions from a phenol coefficient determination.

The paradoxical action of pine oil in being markedly more germicidal than phenol on the typhoid bacillus and decidedly less germicidal on the staphylococcus is an interesting phenomenon deserving further study and is apparently illustrative of specificity in disinfectants.

REFERENCES.

1. CHICK and MARTIN, Jr. Hygiene, 1908, 8, 654.

2. CHURCHMAN, Jr. Exper. Med., 1912, 16, 221 and 822.

3. BROWNING and GILMOUR, Jr. Path. and Bact. 1913, 18, 144.

4. STEVENSON, Public Health Reports, 1915, 30, 3004.

5. HAMILTON, Am. Jr. Public Health, 1917, 7, 282.

6. OHNO and HAMILTON, Am. Jr. Public Health, 1914, 4, 486.

7. ANDERSON and MCCLINTIC, Jr. Infectious Diseases, 1911, 8, 1.

8. DUYSER and LEWIS, Jr. Industrial and Engineering Chem., 1914, 6, 198.

9. ST. JOHN, Jr. Industrial and Engineering Chem., 1914, 6,940.

10. PHELPS, Jr. Infectious Diseases, 1911, 8, 27.

11. WALKER, N. Y. Medical Jr., 1916, 103, 500.

THE PATENT MEDICINE SITUATION.

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Read before the Food and Drugs Section, October 19, 1917, at Washington, D. C.

TO ANY student of the patent medicine problem two events stand out most distinctly as marking turning points in the history of remedial legislation as applied to this disreputable business, namely, the passage of the Federal Food and Drugs Act and the subsequent amendment to that act known as the Sherley Amendment.

The federal law requires a statement on the label of the presence and amount of certain specified habit-forming drugs, and the Sherley Amendment insists that all statements on the label, on the carton or in the literature accompanying the remedy shall be therapeutically correct.

The notification by the label to the purchaser that his favorite remedy contained one or more habit-forming drugs has distinctly discouraged the use of such remedies. This has been particularly true with reference to alcohol. For many years certain of our well-known nostrums, the bitters, the tonics, the sarsaparillas, the "spring medicines," have enjoyed a wide popularity in homes where any thought of hard liquor or booze was taboo. When the government required the labels of these medicines to show that alcoholically they were close kin of whisky, rum or gin, their popularity speedily waned, and today many of them are sold either with their alcohol content reduced or entirely eliminated, or their names have been changed; in some cases their manufacture has ceased altogether. Old Doctor Hartmann first reduced the alcohol in his Peruna from 28 to 17 per cent., then to dodge the excise tax he added some senna and cubeb, and finally, apparently in despair, abandoned the name which had become almost a household word, and gave his nostrum the new name Katarno, in order to bolster up its fast-lagging sales. The bar over which Lydia E. Pinkham still continues to smile so benignantly, while not yet a temperance bar, now requires three drinks of the Vegetable Compound to secure the equivalent of a drink of whisky instead of two as in the good old days. You can no longer get drunk on Ayres' Sarsaparilla, as instead of its former 16 per cent. of alcohol today it contains none at all.

The same condition is found with the more dangerous habit-forming drugs, such as morphin, opium, heroin, cocain, etc. Even before the passage of the Harrison Act, the use of drugs of this character in patent medicines was constantly on the decrease. The average sufferer, unless he were a drug habitué, generally took alarm at the names of these familiar poisons on his medicine bottle, and feared to use the medicine. Accordingly we find many revised formulas for these remedies. The manufacturer does not dare withhold the required information and in many cases has substituted other drugs to allay the public distrust. The patient failing to obtain the customary effect of the active and dangerous drug discontinues the use of the medicine, so that we find certain of the most widely advertised of these nostrums gradually being withdrawn from public sale. The soothing syrups, the "baby-killers," are almost a matter of history today rather than a crying evil. Mrs. Winslow's familiar brand illustrates this point. In 1908 it contained 0.4 grains of morphin per fluid ounce; in 1911 0.16 grain of morphin sulphate per fluid ounce; in 1912 in Great Britain it contained potassium bromid and senna, but no alkaloids; in 1915 Indiana reported it as an anise, caraway and coriander syrup; while today the manufacturer claims senna, rhubarb, sodium citrate, sodium bicarbonate, anise, fennel, caraway, coriander, glycerin and sugar syrup.

The passage of the Sherley Amendment greatly strengthened the Federal Food and Drugs Act. Under a somewhat forced interpretation of the original law the United States Supreme Court held that so long as the manufacturer made no false statements on the label concerning the ingredients of the nostrum, he could not be held guilty of misbranding no matter what curative powers he attributed to it. The Sherley Amendment corrected this alleged weakness in the act, and permits no false statement as to the therapeutic effect of the medicine either on the label, on the carton or in the printed matter which accompanies the remedy. Since the passage of the amendment patent medicine literature has undergone a great transformation. To be sure the millennium has not yet arrived, but the statements as to curative powers are now made in carefully guarded phrases, or are absent altogether. The manufacturers of many of these remedies, apparently under the tutelage of astute legal talent or of commercialized physicians or chemists, have revised their labels and their literature so that they will not run foul of the provisions of this amendment.

The literature of Eckman's Alterative, formerly a consumption "cure," now uses the following guarded language:

"After these changes occur and the system comes under the influence of the alterative, a gradual improvement *should* follow; the appetite *generally* increases, nausea, vomiting and indigestion *usually* cease; expectoration is *facilitated* and the sputum becomes a lighter yellow, thinner and *sometimes* frothy; the severity of the coughing spells *is expected to lessen;* fever *should lessen* and sleep become more restful; chest pains and night sweats *usually* subside. *Generally,* as repair progresses, toxemic symptoms—anaemia, weakness, emaciation, etc.—are remedied and the mental condition *often* changes to one of interest and contentment." (Italics mine.)

Fulton's Renal Compound makes this guarded statement:

"It is to be impressed on patients that what nature does slowly she undoes slowly and that in chronic cases very little is to be expected from the first three or four bottles; in fact, it commonly takes from four to six to begin to make a showing, and it often takes dozens to effect a cure."

Pierce's Anuric Tablets state "it is not to be expected that these tablets are a cure for all serious kidney diseases, when present in chronic form."

Kilmer's Swamp Root says "We do not wish to have anyone take Swamp Root who does not need it, but if people take it who need it, the remedy will do the rest and thus fulfill its great mission."

The net result of these two legislative acts has been a great improvement in the nostrum situation. Nevertheless any one who has made a study of the subject speedily realizes that neither the Food and Drugs Act nor the Sherley Amendment goes quite far enough. It is indeed a great benefit that the user of a nostrum should know whether or not the alleged remedy contains alcohol, morphin, opium, cocain, heroin, chloroform, cannabis indica, chloral hydrate or acetanilid. But why should the declaration of ingredients be limited to these few habit-forming drugs? Is it not almost as important that the consumer should be warned of the presence of bromids, arsenic, ammoniated mercury, corrosive sublimate, lead acetate, pyramidon, santonin, wood alcohol, paraphenylene diamine, strychnin, fusel oil, or other dangerous drugs, especially in light of the fact that so frequently nostrums containing these drugs are labeled "perfectly harmless." In my recent work with patent medicines I have found 6 to contain wood alcohol, 3 ammoniated mercury, 3 bromids, 6 corrosive sublimate, 7 lead acetate, 2 silver nitrate, and one each fusel oil, paraphenylene diamine, pyramidon and pyrogallol. This list includes remedies widely advertised, and presumably widely used, and it would seem that the consumer was entitled to protection against them.

Similarly, the Sherley Amendment while effecting a great improvement in the honesty of the statements of the bottle, the carton and the accompanying leaflet, its provisions in no way affect any statements which the manufacturer may care to make through the advertising columns of the newspaper or the magazine. I have no way in which to prove the statement, but for a long time I have felt that the average consumer of these nostrums pays but little attention to the label of the bottle and even less to the literature that comes with it. Neither the reading of the label nor the studying of the medical treatise which the manufacturer so generously supplies has been the impelling cause which has led to the purchase of the remedy. The flaring newspaper advertisement, or the tawdry window display of the druggist, with possibly a few 65 feet tapeworms on the side, are what have brought the medicine to his attention. Until the advertising columns of our newspapers, our weeklies and our monthlies are thoroughly cleaned up, the solution of the nostrum evil is still far distant.

In the speaker's judgment the most

promising avenue for reform at the present time lies in a quickening of the managerial conscience as to the quality of medical wares he will allow to be advertised with his sanction to his readers. It is indeed a hopeful sign to find that the great advertising associations are beginning to recognize the evil of fraudulent medical advertising and simply as a matter of self-preservation are endeavoring to clean their own Augean stables. The American Pharmaceutical Association and the National Vigilance Committee of the Associated Advertising Clubs of the World both have drawn up regulations concerning medical advertising, which if faithfully followed out will serve as a great protection to the ignorant consumer.

The speaker believes that self-medication is a dangerous pastime, but as long as human nature endures it will be impossible to repress completely man's desire to tinker with his insides. It is quite possible that there is a legitimate field for the advertising of ready-made remedies for the home treatment of common ailments, but granting this possibility certain restrictions are obviously necessary. The National Viligance Committee has drawn up the following eleven requirements, which I think are worthy of our attention for a moment, and which are suggestive as to the steps advertisers themselves are taking to check the evil. In brief these requirements are as follows:

1. The medicine must be appropriate for the particular affection for which it is recommended and must not affect unfavorably the course of the disease.

2. The remedy must not be named or advertised in a way to conceal its proprietary character.

3. The remedy should be offered through the regular wholesale or retail channels of trade, and not directly to the purchaser from the manufacturer.

4. If the preparation contains alcohol, it must be sufficiently medicated to prevent its use as an alcoholic beverage, and the proportion of alcohol should be no greater than that needed to hold permanently in solution the essential active ingredients of the preparation.

5. If the preparation is one which may be taken internally it must not contain cocain, nor opium or any of its alkaloids, in greater proportion than those specified in the Harrison Act.

6. No children's remedy shall contain cocain, or opium or its alkaloids, or their derivatives, in any proportion whatever.

7. If the preparation is one which may occasion injury through misuse, proper warning against such use must be given on the label.

8. The preparation must not be intended for use as an abortifacient nor for any other immoral or illegal purpose, nor must it be advertised directly or indirectly for such a purpose.

9. The preparation must not be advertised or recommended, directly or by inference, as a cure for the diseases or conditions generally recognized as incurable by the simple administration of drugs, or for the cure of contagious diseases or those sufficiently acute to require skilled treatment.

10. The preparation must be in strict conformance with the Sherley Amendment.

11. Advertising not accompanying the package shall conform substantially to the statements on the label, carton or accompanying circular as to origin, composition, character and curative value.

The above outline in my judgment offers a basis for valuable constructive work. Certain cities, such as New York, Washington and Cleveland, have made more or less successful efforts to check the nostrum evil, and it would seem that the propaganda against the abuse and misuse of these remedies should form part of the program of every well-organized health department.

The responsibility for the wide use of these nostrums of course rests in a large measure on their makers, but even the most misguided manufacturer would not continue to make what he could not sell. The physician, the newspaper, the druggist and the consumer must share the responsibility for this menace to the health of our people. Some physicians make patent medicines, some testify for a consideration as to their worth, some actually prescribe them, in spite of the fact that in many cases they must be uncertain as to the composition of the medicines they are prescribing; the responsibility of such physicians is great. The newspapers must likewise bear much of the responsibility as they for mere dollars continue to allow their advertising columns to be used for the exploitation of remedies whose worthlessness, fraudulence and dangerous character have been exposed over and over again; they give the nostrum maker his chief stock in trade, publicity, and totally disregard their obligation to supply their readers with honest advertisements as well as accurate news. The druggist, both wholesaler and retailer, as the purveyor of these wares, is equally responsible. In spite of the frequent claim made by him that he would prefer not to handle proprietaries, we find that his advertisements generally lay stress not on his ability to compound accurate and reliable prescriptions but that he sells patent nostrums at cut-price rates. Not only does he sell these proprietaries, but with hardly an exception each druggist makes his own little line of "just-as-good," or "just-as-bad," preparations, thereby putting himself on the same basis as the general manufacturer. The mere fact that a group of 10,000 or 25,000 or 100,000 druggists makes a line of preparations widely acclaimed as "not patent medicines" in no wise removes them from the category of the nostrum makers. Furthermore certain druggists in order to gain a little free advertising are willing to allow their names to be used in the exploitation of remedies which from their very experience and training they must know to be fraudulent. Tanlac, Lax-A-Tone, Quaker Herb Extract, Fruitatives, are examples of medicines which have been recently exploited in my town under the guidance of our local druggists, and I presume this condition is quite universal. The great manufacturing drug houses, presumably organized on high ethical planes, directly cater to the nostrum trade. In a recent visit to the factory of one of the leading firms of this character, I noticed cartons for Limestone Phosphate, Wyeth's Sage and Sulphur and Sargol, all notorious fakes.

And lastly, the consumer. His responsibility is indeed great and he is the main sufferer. He has been encouraged to indulge in that dangerous luxury "self-medication"; sometimes he has felt benefited, in his ignorance confusing stimulation or deadened pain with cure. It will take a long time to reform the manufacturer, the physician, the newspaper, and the druggist, but the consumer can reform himself. He can refuse to buy this stuff and by his example encourage others to imitate him.

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A SIMPLE MEDIUM FOR THE DIFFERENTIATION OF MEMBERS OF THE TYPHOID-PARATYPHOID GROUP.

I. J. Kligler,

Department of Public Health, American Museum of Natural History, New York.

Read before the Laboratory Section at Cincinnati, Ohio, October 25, 1916.

RAPID differentiation of closely related organisms by a simple cultural test is not always possible. Serological tests are often helpful, but with the intermediate members of the colon-typhoid bacilli even this method is not always reliable. Moreover not every laboratory has the necessary sera on hand. Typhoid and paratyphoid bacilli can be distinguished from one another by their fermentation of glucose, the former producing acid and no gas while the latter produce both gas and acid. This reaction is sufficiently constant to be depended upon though aberrant strains are occasionally encountered. However, no satisfactory cultural test for the differentiation of the paratyphoid bacilli has been reported until recently.

In 1905 Sacquépée and Chevrel (1) found that, under a given set of conditions, paratyphi A and B and B. typhi can be differentiated by means of lead acetate. The authors were of the opinion, however, that the reaction was not constant unless exact experimental conditions were duplicated. Probably, as a result of this conclusion, no one attempted to confirm their findings.

Recently Burnet and Weissenbach (2) (1915) reported the results of an extensive comparative study of the agglutinations and lead acetate reactions of five hundred and seventeen strains of B. typhi, B. paratyphi A and B. From their study they concluded that the lead acetate medium can be used for the differentiation of these types. On testing this medium with eighty-five strains of colon, typhoid and intermediate forms it proved to be highly satisfactory for the separation of B. typhi and B. paratyphi B from B. paratyphi A, but the first two could not be distinguished from one another.

It seemed probable that, if this medium could be so modified as to combine gas production from glucose with the lead acetate reaction, a simple method would be at hand for the rapid differentiation of these bacilli on the basis of two important biochemical properties.

Neither of the authors mentioned say anything about the nature of the lead acetate reaction. At first thought one would expect it to be a reaction between the H_2S liberated and the lead. If that were so sugar, exerting a sparing effect on the utilization of peptone, should inhibit or completely interfere with the reaction. This was found not to be the case. The experiments indicated that the reaction involved is probably a reduction of the lead acetate to lead oxide (PbO_2) which is brown. It was noted, however, that an excess of sugar did interfere with the lead acetate reaction, while an excess of lead inhibited growth.

The following medium finally proved satisfactory:

(1) Meat infusion agar containing ¾ per cent. or 1 per cent. agar (depending on the moisture content of the agar shreds).

(2) 0.1 per cent. glucose.

(3) 0.05 per cent. lead acetate.

The optimum reaction is P H 7.2–7.6.

The agar is prepared in the usual way, except that ¾ per cent. or 1.0 per cent agar is used instead of the usual 1.5 per cent. This gives a semi-solid medium which has several advantages. Gas production is readily observed by the diffusion of bubbles and the breaking up of the medium. Moreover the softness of the medium permits the motile organisms to grow away from the line of inoculation, giving the growth a brush-like appearance which can be used as an additional differential test.

The sugar and lead are dissolved in water separately, sterilized and added sterily to the agar. It is necessary to cool the agar to about 60° C. before adding the lead and to rotate the tube to obtain uniform distribution. This gives a clear transparent medium. If this precaution is not taken, the lead floculates the peptone and before the tube cools most of the precipitate settles to the bottom of the tube. As a precautionary step the tubes should now be incubated to insure sterility.

Stab inoculations either from fresh plate colonies or broth cultures are made with a platinum wire and the tubes incubated for eighteen to twenty-four hours. Strains of B. typhi brown the medium along the line of growth; B. paratyphi B produces browning and also gas; B. *paratyphi A* causes no browning but produces gas; and, finally, B. *dysenteriæ* produces neither browning nor gas.

Altogether eighty-five strains, representing all the various species included in the colon-typhoid family, were tested. The number of cultures of each type studied and their reactions are summarized in Table I. Two sharply defined groups are obtained according to whether the organisms brown the medium or not. In one group are included the typhoid, para-

TABLE I.

CHARACTERISTIC DIFFERENTIAL REACTIONS OF TYPHOID, PARATYPHOID AND DYSENTERY BACILLI.

Name of organism	No. of strains	Per cent. browning medium	Per cent. showing gas
B. typhi.......	22	100*	000
B. paratyphi B.	5	100	100
B. enteritides ..	4	100	100
B. murium.....	3	100	100
Danysz.....	3	100	100
Icteroides...	1	100	100
	—	—	—
Total.......	38		
B. paratyphi A	10	0.00	100
B. cholera suis .	5	0.00	100
B. voldagsen...	1	0.00	100
B. abortivus ...	3	0.00	100
B. from horse (paratyphoid)	1	0.00	100
B. dysenteriæ...	7	0.00	000
B. pullorum....	3	0.00	000
	—		
	30		
B. alcaligenes.....	1	0.00	000
coli bacilli.......	17	6.0	100

NOTE: It is interesting to note that with the exception of B. murium all the animal pathogens group themselves under B. paratyphi A.

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*B. typhi does not as a rule produce as much browning as the B. *paratyphi B*.

typhoid B, enteritidis and the danysz rat virus bacilli. B. icteroides, once thought to be the cause of yellow fever, falls in this group. In the second group are included the B. paratyphi A, the B. suipestifer, swine typhoid, B. abortivus and dysentery, pullorum and alcaligenes; also all the strains but one of coli, ærogenes and cloacæ examined. Each of these two groups can readily be subdivided in the same medium into subgroups based on the gas production. Thus in group one gas production divides the typhoid from the paratyphoid B, enteritidis and murium bacilli. Group two is split into the paratyphi A, cholera suis, etc., and the dysentery and pullorum bacilli.* Another differentiating character which distinguishes the subgroups of group two is the diffusibility through the soft medium of the motile organisms. The paratyphi and suipestifer, being motile, form a halo around the line of inoculation, the dysenteria and pullorum, on the other hand, show a sharply defined pencil of growth along the line of inoculation. This latter character may also serve to distinguish dysentery and pullorum bacilli from B. typhi.

We have, thus, in a single tube a simple medium which enables us to differentiate the organisms grown on the basis of three distinctive characteristics: motility, carbohydrate fermentation and lead acetate reduction. From the observations of the French authors and my own results there appears to exist a degree of constancy which renders the lead acetate test absolutely reliable. Most of our strains have been tested at least half a dozen times during a period of three to four months without any variations in the results. The constancy of the gas productions is so generally accepted that it requires no comment. The motility test is not as certain as the others but it serves as a confirmatory distinctive character for the separation of the pullorum and dysentery bacilli from all the others. In addition to combining three tests the medium is easily prepared, the ingredient inexpensive and readily obtainable.

This medium obviously does not differentiate the organisms intimately related with paratyphi B. (B. enteritidis, B. murium) or those closely resembling B. paratyphi A (B. suipestifer, abortivus, voldagsen) from each other. But in this respect it does not differ from any other medium proposed heretofore. It rather tends to emphasize the close relationship between the members of these two large groups and, from what we know about these organisms, it is reasonable to consider the members of each group as subspecies or varieties of the main types. These two types—B. paratyphi A and B. paratyphi B—can be readily distinguished from one another by the aid of this medium.

Since this paper has gone to press, I have found that this medium may be successfully combined with the Russell* double sugar tube. 0.05 per cent. basic lead acetate is added, as directed above, to the double sugar medium and the tube slanted and the inoculation made as directed by Dr. Russell. Andrade's indicator (1 cc. to 100 cc. of agar) must be used in place of litmus. The results were identical with those recorded above. The indicator does somewhat obscure the reaction of the typhoid but not that of the paratyphoid bacilli. Care must be taken to use lactose free from glucose, since an excess of glucose vitiates the efficacy of the medium. The advantages of this modification are obvious.

References.

1. Sacquépée et Chevrel, *1905*. Compte reudus de la Soc. de Biol., p. 535.

2. Burnet, E., and Weissenbach, R., *1915*. Compte reudus de la Soc. de Biol., *78*, 565.

Received for publication, October 1, 1916.

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*B. pullorum is a slow gas producer and usually does not produce sufficient gas to break up the medium. It is, however, of little significance since it is not pathogenic for humans.

*Jour. Med. Res., 1911, *25*, 217.

ABSTRACT OF MINUTES OF THE FORTY-FIFTH ANNUAL MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION HELD AT WASHINGTON, D. C., OCTOBER 17–20, 1917.

First General Session, October 18, 1917, 11.30 A. M., New Willard Hotel.

Called to order by President W. A. Evans.

The following Committee on Resolutions was appointed: Dr. Haven Emerson (Chairman), Dr. Chas. J. Hastings, Dr. Oscar Dowling, Dr. T. D. Tuttle, Dr. R. Guiteras, Dr. M. S. Iglesias.

The following Committee on Deceased Members was appointed: Dr. Peter H. Bryce, Chairman, Dr. John A. Vogelson, Dr. J. W. Trask, Dr. P. S. Schenk and Dr. J. D. Robertson.

Dr. W. A. Evans then read his presidential address.

The members next grouped themselves for election of representatives to the Advisory Council.

Second General Session, October 18, 1917, 7.45 P. M., New National Museum.

Called to order by President Evans.

The following resolutions presented by the Committee on Resolutions were adopted by the Association:

Resolution

Resolved, That the American Public Health Association present the following memorandum to the President of the United States, expressing the conviction of its members that the present circumstances demand, and the time is now ripe for a concerted effort to protect and conserve the health of the civil population. And be it resolved further that the President of the American Public Health Association be authorized to appoint a committee to carry this resolution and memorandum to the President of the United States.

Memorandum.

We recognize the success of the President in his development of a broad program, conserving the industrial efforts and economic resources of the country, and concentrating them upon the prosecution of this war for our continued existence in freedom. The experience of countries longer in war than ourselves has demonstrated the equal necessity of organizing the national resources for the conservation of human life and the maintenance of the health and energy of the civil population, which under an increased stress to support the military activities of the nation, is now subjected to unusual disturbance of social and economic equilibrium, leading inevitably to an increase of disease, disability and premature mortality. At this very time, when our people at home are in greater need than usual of medical and surgical care and of community health protection, we find large numbers of physicians and sanitarians necessarily withdrawn for military service, with the result that large areas and considerable groups of population are left inadequately provided for.

We, therefore, beseech your interest in such development of the Public Health Service as will provide a national program for the coordination and direction of the efforts of all local, state, and national health agencies along the most effective lines, and will bring home to the whole country the importance of health protection, and to each individual the rôle he must play in order to maintain his own health and that of the community.

We make this petition in the confident belief that the universal spirit of service and coöperation, which now prevails throughout the country, guarantees to such a program of education and protection, a success never before attainable in the conservation of our greatest asset—the nation's health.

To the end that such a program of health administration may be put into effective operation, and the emergencies and opportunities of the time be met in a way commensurate with the federal responsibilities, we believe that a generous appropriation should be made available for the Public Health Service.

RESOLUTION

Resolved, That the American Public Health Association urges upon all federal, state and local health authorities; upon physicians, hygienists and sanitarians; and upon all organizations interested in or dealing with the public health, the importance of unusual solicitude and activity in conserving and promoting the health of the civilian population during and after the present war.

Resolved, That this Association recommend that all local, state and provincial health departments be coördinated with the federal authorities during the period of the war, by the appointment of local, state and provincial health officers, where practicable as officers in the United States Public Health Service, or in the Provincial Health Service respectively as Reserve Officers; and that, if the authority of Congress, or of the Provinces is needed to permit such appointment of officers, this Association respectfully urges Congress and the provincial legislatures to pass such enabling bills as will permit the proper federal and provincial authorities to make such appointments and to undertake such plan of coördination.

Approved by the Committee on Resolutions October 18, 1917, and presented at general session at 8 P. M. on the same day by the chairman, H. Emerson.

Addresses were delivered by Surgeon-General W. C. Gorgas, U. S. A., Surgeon-General W. C. Braisted, U. S. N., and Assistant Surgeon-General J. W. Trask, U. S. P. H. S.

Captain J. Gilmore read a paper for Col. T. W. Goodwin, "The Preservation of the Health of the Soldier on the Western Front."

Dr. Simon Baruch demonstrated certain toilet devices for use in trenches.

The meeting then adjourned to the upper floor to visit the art gallery of the New National Museum and to listen to a concert by the Marine Band.

THIRD GENERAL SESSION, OCTOBER 19, 1917, 9 A. M., NEW WILLARD HOTEL.

Called to order by Dr. Donald B. Armstrong, Chairman of the Sociological Section.

The following papers were presented:

Tuberculosis and the War, by Dr. Otto Eichel.

Venereal Diseases and the War, by Surgeon-General Gorgas.

Contagious Diseases in the War, by Surgeon-Major Edward Rist.

Rehabilitation of Diseased and Injured Soldiers Due to the War, by Major Elliott Brackett.

War and the Food Problem, by Herbert C. Hoover.

Adjournment.

FOURTH GENERAL SESSION, OCTOBER 19, 1917, 8 P. M., NEW NATIONAL MUSEUM.

Called to order by President Evans.

The following resolutions were presented by the Resolutions Committee, and adopted by the Association:

RESOLUTION

Resolved, That the thanks of the American Public Health Association be extended to the American Red Cross for its establishment of a Bureau of Sanitary Service for the purpose of assisting the various health authorities in the maintenance of effective sanitary control of the communities adjacent to cantonments, and other important military establishments; and

Resolved, That the American Public Health Association hereby pledges itself to coöperate fully and heartily, whenever desired, with said bureau, and all other activities of the Red Cross, for the conservation and promotion of the public health.

RESOLUTION

Resolved, That the Section on Industrial Hygiene of the American Public Health Association offer the following resolution for the consideration of the Association and prays its adoption. That the National Council of Defense immediately have established under the United States Public Health Service a Bureau of Information that shall promote the installation of medical supervision in all plants employing 1,000 or more employees; furthermore,

Resolved, That all industries engaged in governmental contract work be required to institute such medical supervision; and finally

Resolved, That a copy of these resolutions be presented to the Council of National Defense.

The chair appointed the following committee to present to the President of the United States the resolution passed at the previous meeting, which related to the United States Public Health Service: Dr. E. G. Williams; Dr. Haven Emerson; Dr. A. R. Reynolds.

Dr. Rudolph Hering, on behalf of the Board of Directors presented the following report:

REPORT OF COMMITTEE ON CONSTITUTION.

The Board of Directors beg leave to report as follows on the amendment of the Constitution:

It is recommended that the constitution of the Association be amended so as to provide

First: For a Health Association to be formed in each of the United States, in the Dominion of Canada, the Republic of Mexico and the Republic of Cuba.

Second: For a Board of Directors composed of delegates from these Health Associations, in addition to the directors elected by the sections and the ex-president.

Third: For four Vice-Presidents—one from each county represented in the Association.

Fourth: For an Executive Committee of seven persons, composed as follows: the president, the secretary, the treasurer and four elective members whose terms of office shall be so arranged that one member shall drop off and his successor be elected each year. The term of each elective member to be four years.

The report was accepted with motion to consider at the next annual meeting.

The following papers were read:

The Red Cross Sanitary Service, by Dr. W. H. Frost.

Sanitation in Canadian Camps and Barracks, by Major J. W. S. McCullough.

War and Mental Diseases, by Major Pearce Bailey.

What the Soldier Fighting in France Should Know about Tuberculosis, by Dr. S. A. Knopf.

Adjourned.

FIFTH GENERAL SESSION, OCTOBER 20, 1917, 2 P. M., NEW WILLARD HOTEL.

Called to order by President Evans.

Doctor Sawyer reported nominations for officers of the Association, on behalf of the Advisory Council.

The following officers were unanimously elected to serve for the next year:

President, Dr. Chas. J. Hastings, Toronto, Ont. First Vice-President, Dr. Geo. M. Kober, Washington, D. C. Second Vice-President, Dr. Manuel S. Iglesias, Vera Cruz, Mex. Third Vice-President, Dr. G. H. Sumner, Des Moines, Ia. Treasurer, Dr. Lee K. Frankel, New York City.

On nomination of Doctor Sawyer, representing the Advisory Council, the following directors were elected for the ensuing three years:

Dr. John B. Anderson of Spokane to succeed Dr. Tuttle of Washington.

Dr. C. S. Caverly of Vermont to succeed himself.

Dr. P. M. Hall to succeed himself.

Dr. Frazer of Manitoba to succeed Dr. Bell of Manitoba.

Dr. Seymour to succeed Dr. Wood.

Dr. John Landis to succeed Dr. R. H. Bishop of Cleveland.

Dr. John Hurty to succeed Dr. Morgan of Indianapolis.

Dr. Galarreta of Cuba to succeed Dr. Agramonte of Cuba.

Dr. B. L. Arms of Florida to succeed Dr. Monjaras of Mexico.

Dr. McGurren of North Dakota to succeed Dr. Ladd of North Dakota.

Dr. J. T. Black was elected a director to succeed Dr. H. Conn, deceased; and Dr. P. S. Schenk was elected to succeed Dr. E. C. Levy, resigned.

Following the recommendation of the Advisory Council the Association unanimously elected Mr. Herbert C. Hoover, Food Administrator of the United States, to honorary membership in the Association.

The following resolutions were adopted:

RESOLUTION

Resolved, That the American Public Health Association express its appreciation and grateful acknowledgment to the Committee on Arrangements, the Reception Committee, and the Ladies' Entertainment Committee for their painstaking and thoughtful care for the needs and comfort of the Association;

Resolved Further, That the Secretary and Regents of the Smithsonian Institution and the managers of the New Willard and New Ebbitt Hotels and the Chamber of Commerce and its Secretary, Mr. Thomas Grant, be thanked for the facilities they placed at our disposal when a multitude of demands made their action on our behalf particularly difficult.

Resolved Further, That the devotion of the Chairman of the Committee on Arrangements, Dr. George M. Kober, be acknowledged by a rising vote of thanks.

RESOLUTION

Resolved, That it is the sense of the American Public Health Association that the Federal Bureau of Education should attempt to discover what is proper practice as to continuing or closing the schools as a means of controlling epidemics of measles, whooping-cough, scarlet fever, diphtheria, smallpox and poliomyelitis, and that they should publish their conclusions in the annual report of the Bureau and in bulletin form; and

Resolved Further, That a copy of this resolution be forwarded to Dr. P. P. Claxton, in charge of the Bureau.

RESOLUTION

WHEREAS, The American Public Health Association recognizes that in the field of science there have been no victories which have added more to the human needs and happiness than those of public health, and

WHEREAS, The wide sphere of action covered by the work of sanitarians often requires them to direct their energies into places of danger greater even than those of war; and

WHEREAS, The construction of the Panama Canal, one of the world events of recent years has been made possible through the triumphs of sanitary science, the chief exponent of which in that work was a member of long standing in this Association; therefore be it

Resolved, That this Association desires to bring this fact through the proper channels to the attention of the trustees of the Nobel Prize Fund with a view to having Dr. Wm. C. Gorgas, Surgeon-General of the United States Army, honored by bestowing upon him the Nobel Prize for the good work he has accomplished in placing yellow fever in the list of preventable diseases.

RESOLUTION

Resolved, That the cordial and hearty thanks of the American Public Health Association are tendered to Prof. Selskar M. Gunn, on account of his faithful and efficient services as Secretary of the Association, and as Editor of the JOURNAL, and it is the wish and hope of the Association that Professor Gunn will be successful in the work he is now doing for his country and human liberty, and that he will finally return safely in health, to again serve in the public health cause.

Resolved Further, That these resolutions be sent to Professor Gunn in France by the President of the Association.

Dr. Peter C. Bryce on behalf of the Committee on Necrology, reported as follows:

The Committee begs to report:

That the past year has seen the passing away of several most earnest and prominent members of the Association, amongst whom the names of Dr. H. B. Holton of Vermont and Professor H. W. Conn of Connecticut will be recalled. Doctor Holton as a treasurer, president and member of the Executive and Chairman of the Editorial Committee, long played an important part in promoting the highest scientific interests of the Association. Professor Conn, as a member of the oldest section of the Association, for many years added much to the practical work done under the Section of Chemistry and Bacteriology and was at the time of his sudden removal an active member of the Executive Committee of the Association, which felt the loss of so valuable a member.

To all friends of these members and of any others who are included in the list of deaths, the committee recommends

That the secretary be instructed to convey a copy of this report, with the expression of the regrets and sympathy of the members of the Association for them in their loss.

The Board of Directors then retired to transact business.

Résumés of section conferences on war problems and of section proceedings were presented as follows:

Dr. Henry Albert, Laboratory Section.

Dr. J. W. Trask, Vital Statistics Section.

Dr. D. B. Armstrong, Sociological Section.

Dr. Geo. M. Kober, Industrial Hygiene Section.

Mr. Lucius P. Brown, Food and Drugs Section.

Dr. E. C. Levy, Public Health Administration Section.

Dr. B. S. Warren announced for the Committee on Health Insurance that no report would be made, but recommended the continuance of a Committee on Health Insurance, since war conditions demonstrated the need of such measures.

The report was adopted.

By a rising vote, a resolution of thanks to the Ladies' Entertainment Committee was adopted.

After remarks by the officers for the coming year, the convention was adjourned.

W. A. Evans,
President.
A. W. Hedrich,
Acting Secretary.

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Errors in Death Registration.—That it is essential to increase the accuracy of death registration, is the opinion of Dr. A. R. Perry, of the United States Department of Labor, Bureau of Labor Statistics. In an investigation of errors in death registration in the industrial population of Fall River, Mass., Doctor Perry found that frequently the actual cause of death might be misstated; or that the secondary cause might be unrecorded; or that the decedent's occupation might be incorrectly given.

The actual misstatement of the cause of death occurred most numerously in cases where tuberculosis was the real though not the recorded cause of the disease, and also where death was really due to childbirth. It was found that 17 per cent. of all the fatal tuberculosis in the city was reported as due to nontubercular causes. Also that 26 per cent. of all the actual parturition fatalities were not properly reported. It is thus possible for some physicians through willful negligence or ignorance to retard progress in industrial hygiene and preventive medicine.

Association Closes Office for Duration of War.—The Association for the Prevention and Relief of Heart Disease has decided to discontinue its investigations and educational propaganda for the duration of the war, owing to the induction of the Executive Committee into various branches of service for the nation.

Medical Inspection in Schools of Great Britain.—In *Bulletin No. 49* of the Bureau of Education of the Department of the Interior, there is given a comprehensive view of the development and scope of medical inspection of school children in Great Britain. The report is written by E. L. Roberts.

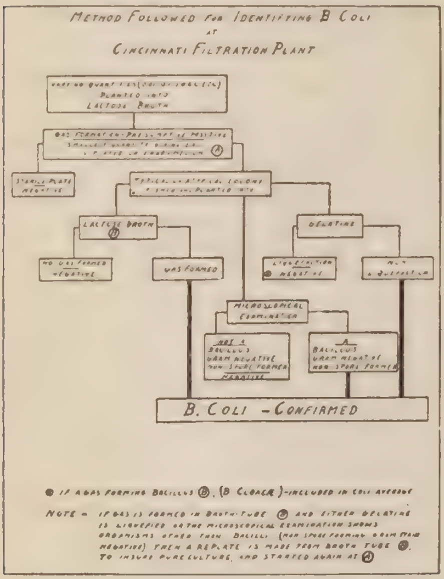
Medical inspection of school children is now compulsory throughout Great Britain. The work, however, was voluntarily begun in London in 1891. Later, 1893, Bradford, England, and in 1906, Dumfermline, Scotland, followed. In 1907, medical inspection was made compulsory in the schools of England and Wales, and in 1909 the same was done for Scotland.

The work is nominally in charge of the Board of Education, but the actual work and immediate supervision are conducted by medical officers, inspectors of physical training, school nurses, physicians and dentists. The work is varied. Every child is thoroughly examined and defective children are segregated from the rest and educated apart from the normal children. Special attention is also given to the blind, deaf, crippled, and incorrigible children. Eye and ear defects are noted and remedial measures are recommended. Specialists are employed on a part time basis for the treatment of eye, ear, nose, throat and skin diseases. Many dentists are employed both for inspection work and for treatment. Special attention is given to the feeding of necessitous children, as well as other children who desire a warm and wholesome midday lunch on the school premises at a minimum cost. Part of the work is the inspection of schools, and recommendations for improving old structures and for designing new ones. A report is made on the condition of the ventilating system. The nature of the desks and benches used by the children is studied. Inquiry is also made into the effectiveness of the lessons on personal hygiene that are taught in the schools. Open air classes are observed and carefully studied.

METHOD OF ISOLATING AND IDENTIFYING BACILLUS COLI USED AT THE CINCINNATI FILTRATION PLANT.

STEPHAN J. HAUSER,
Cincinnati, Ohio.

THE B. coli group may be defined as ærobic non-spore forming Gram-negative bacilli, fermenting lactose with production of gas, and not liquefying gelatine. At the Cincinnati Filtration Plant the attempt is made to carry out the examinations so that the above definition is fulfilled as completely as possible, consistent with the speed and facility necessitated by routine water analysis. The method followed is illustrated graphically by the accompanying chart and this paper is primarily an amplification and discussion of the procedure therein contained.


METHOD FOLLOWED FOR IDENTIFYING B COLI AT CINCINNATI FILTRATION PLANT
Planted into Lactose Broth
Ⓐ
Sterile Plate Negative
Lactose Broth Ⓑ
Gelatine
No gas formed Negative
Gas formed
Liquefaction Negative
Microscopical Examination
Bacillus Gram Negative Non Spore Former
Negative
Bacillus Gram Negative Non Spore Former
B. COLI – CONFIRMED
● If a gas forming bacillus Ⓑ. (B Cloacæ)-included in coli average
NOTE – If gas is formed in broth-tube Ⓑ and either gelatine is liquefied or the microscopical examination shows organisms other than bacilli (non spore forming gram stain negative) then a replate is made from broth tube Ⓑ. to insure pure culture, and started again at Ⓐ

The particular water samples under examination are planted into lactose broth. Lactose broth is used rather than lactose bile, which is the medium recommended in the 1912 edition of the Standard Methods of Water Analysis of the American Public Health Association, for the reason that, not only at this laboratory, but at the laboratory of the Ohio River Investigation of the United States Public Health Service and other laboratories, it has given consistently a higher percentage of confirmed end-results from original inoculations. In planting the water sample decimal dilutions are used to facilitate computations of the B. coli index. In routine examinations, at least three dilutions are used in order to obtain, if possible, a negative and a positive test. The formation of gas in any amount after forty-eight hours incubation at 37° C. is recorded as positive and considered as presumptive positive. The smallest quantity of water giving gas is then confirmed.

A loop-full of culture from the tube furnishing the presumptive test is stroked upon Endo's medium previously poured in plates. The plates are incubated at 37° C. for twenty-four hours. If no ærobic colonies (sterile plate) develop, the respective gas formation is considered due to anærobes, and B. coli is recorded as not present. If ærobic colonies develop, the most typical of B. coli is transplanted into lactose broth and gelatine and a microscopical examination made directly. As there are several varieties of typical B. coli colonies, experience alone will determine the choice.

If in the lactose broth transplant, no gas is formed after the forty-eight hours at

37° C., the result is considered negative, and B. coli is recorded as not present. If gas is formed the result is considered positive for B. coli, subject to the results of the gelatine transplant and a microscopical examination. If after forty-eight hours' incubation at 37° C. the gelatine transplant will solidify on cooling, the culture is considered as non-liquefying. If the gelatine does not solidify on cooling, and gas is formed in the lactose broth transplant and the microscopical examination demonstrates a bacillus, the organism is called B. cloacæ and included in the B. coli numerical estimation as it has the same sanitary significance.

The microscopical examination consists of a smear made according to the method of Gram from the Endo plate colony selected for transplanting. A Gram-negative non-spore forming bacillus obtained following the above procedure fulfills in every particular the definition for the Bacillus Coli. If other than a Gram-negative non-spore forming bacillus is obtained, it is not considered B. coli and is so recorded, but such a result is unlikely and has not been encountered in our experience. The liquefaction of gelatine and discordant results in the microscopical examination accompanying gas production in the lactose broth transplant are likely to be due to mixed cultures, in which case separation should be made by replating from the lactose broth transplant.

Estimation of the B. coli index is made according to Phelp's method, that is, the reciprocal of the smallest volume of water which gave a positive test is taken as the approximate number of B. coli per cc. and is recorded as such. In case of an anomaly it is assumed that the positive result should have been negative and the negative result positive and is so considered in obtaining the B. coli index. If a negative confirmation test is obtained, B. coli is considered present in the next larger quantity without confirmation. If a negative result is obtained from the largest quantity planted, either by no gas formation in the original planting or by a negative confirmation test, B. coli is considered present in the next larger amount that would have been planted except that a negative result in 100 cc. is recorded as zero. The assumption is valid only in the case of waters such as are encountered in water purification plants where the approximate coli content of the water is known. Such assumptions are rarely necessary as the quantities of water chosen for examination can ordinarily be changed in sufficient time to always obtain a positive test. It is probable that this assumption causes less error than would be introduced by either omitting the figure from the averages or calling it zero.

The laboratory work above described with the numerical estimations of B. coli derived are recorded for the month under the headings of waters in the consecutive stages of purification. The form used is convenient and compact and lends itself readily to a grasp of conditions throughout the plant at any time. Five days from the collection of the water sample, B. coli may, following the above scheme, be satisfactorily and conclusively isolated and identified to conform to the definition.

The following table will show the number of samples examined, according to this method, from January to October, 1916, and the percentage of samples confirmed as B. coli.

	River water.	Settled water.	Applied water.	Filtered water.	
				Effluent from filters.	Outlet clear water reservoir.
Samples tested	271	257	266	258	194
Percentage confirmed	97.4	91.0	96.6	94.9*	86.1*

* Includes one sample that showed B. cloacæ.

Book Reviews.

Handbook of Health in War and Peace. A Manual of Personal Preparedness. *By C.-E. A. Winslow, with a Foreword by Henry Fairfield Osborn. Department of Public Health and Public Education of the American Museum of Natural History. New York, 1917. Pp. 51. Paper 25 cents.*

This little handbook constitutes an admirable health guide, and contains a surprisingly large amount of practical information within small compass. The topics taken up include Food and Nutrition, Pure Foods and Clean Foods, Rest and Exercise, Posture, Fresh Air, Clothing, Bathing, Care of the Teeth, Drugs and Stimulants, Hygiene of Adult Life, Man and the Microbe, Disposal of Wastes, Insects and Disease, Spread of Disease, Immunity, Tuberculosis, Racial Health, Accidents and First Aid.

The material is well chosen, the presentation simple, clear and interesting. The booklet is certainly most helpful.

Charles F. Bolduan, M. D.

Preventive Medicine and Hygiene. *By Milton J. Rosenau, Professor of Preventive Medicine and Hygiene, Harvard University. Third Edition. D. Appleton and Co. New York, 1917. Cloth, $6.50.*

According to the preface, the present (third) edition of this well-known work might be called a "special" or military edition for it has been prepared to meet the needs of the present emergency. It contains a discussion of the Duties and Organization of the Sanitary Corps, the Examination of Recruits, Diseases of the Soldier, Sanitation of Troops in Camp and on the March; Sanitation of Barracks and Trenches, Physical Training, Personal Hygiene and Equipment of the Soldier, Red Cross, Rations, etc.

The new material is presented in the form of an added chapter, XIII, entitled "Military Hygiene," and embracing 120 pages. It is obvious that within this compass only a brief outline of the essentials of this important subject can be given. Nevertheless the author has admirably succeeded in condensing a large amount of useful material, and in doing so has apparently utilized the most recent sources of information available.

The book remains, as before, the most useful single work on the subject of preventive medicine and hygiene.

Charles F. Bolduan, M. D.

Notes on the Use of Pin Maps and Charts by Health Officers. *Gardner T. Swarts, Jr., C. E., Providence, R. I. Educational Exhibition Company, 1917. Illustrated. Price, 25 cents.*

This little pamphlet of 24 pages, essentially an advertisement for the Educational Exhibition Company's materials, is in fact a valuable guide in modern graphic methods. In its especial field of the use of pins, it supplements the larger standard statistical works, such as "Graphic Methods for Presenting Facts." No health officer can grasp the details of the incidence and distribution of epidemic diseases in relation to population, except through some graphic method of locating the cases. To this end spot maps have come into general use and they are valuable as permanent records that can be filed in small space.

The pin method with beads and other accessories, described in this booklet, is adopted to display a much greater variety of information on one map. From the quoted examples of use by various departments of health, the health official can readily get valuable pointers in adopting the method to his own requirements.

Herman R. Bundesen, M. D.

A Correction.

In an earlier issue of the Journal we published a review of Parker's "City Milk Supply," in which the price was given as $1.50. We are informed by the publishers, McGraw-Hill Book Co., that the price is $5.00 net, and not $1.50.—Editor.

The Nation's Health. *Sir Malcolm Morris, K. C. V. O. New York: Funk & Wagnalls. 152 pp. Cloth, $1.25 net.*

This volume on the stamping out of venereal disease deals with a most important aspect of the nation's health, and one that has been brought into emphatic prominence by the war-conditions under which most of the nations at the present time are living.

Written by a member of the Royal Commission on Venereal Diseases of Great Britain, a member of the Executive Committee of the National Council for Combating Venereal Diseases, and, withal, one who has seen much of these diseases in a long professional career, it was bound to be scientifically accurate and authoritative. That it is also simple and direct in method and most readably clear in style enhances its value for the general public.

The symptoms of these diseases, their course and sequelæ, are set forth in phraseology which the laity can understand. Much that has heretofore been for the general public little more than medical terms to conjure with, such as the Wassermann test, the salvarsan treatment, neo-salvarsan and others, are here made plain for the uninitiated.

Some of the vital questions considered are indicated by some of the chapter-headings: The Prevalence, Distribution, and Economic Effects of Venereal Disease, Facilities for Diagnosis and Treatment, Should Venereal Diseases be Notifiable, The Policy of Regulation, The Urgency of the Question, etc.

Altogether, the book impresses one as a valuable adjunct in the vital work of awakening the general public to the need for the suppression of venereal diseases and the best way to go about it. *F. J. Osborne.*

Sanitation, Practically Applied. *H. B. Wood. New York, 1917. John Wiley & Sons. Pp. 463. Price, $3.00.*

Dr. Wood in this volume shows a remarkable appreciation of the relative importance and value of the different lines of work to be carried on by the health officer. Unfortunately, most writers on public health are too much under the spell of tradition and teach what has been done rather than what ought to be done. Not so the writer of this book, who, in the division of his subject, has thoughtfully apportioned his space according to the importance of the matters treated and has placed emphasis where it properly belongs. The chapter on contagious diseases is naturally the longest one. The more important diseases are taken up in turn and in a remarkably concise way the practical details of their control are touched upon. There are also chapters on vital statistics, food control, in which the distinction between economics, esthetics and health is kept clearly in mind, on milk, water, sewerage, industrial hygiene, insect carriers and on education, in the last of which it is insisted that the visiting nurse is more efficient for intensive education in unpromising quarters than is any other agency.

The book is written particularly for the health officer in the smaller municipalities and in the rural districts, though it is stated that it is intended also for laymen who are interested in promoting the health of their communities. Most books on public health are written from the standpoint of the administrator in a city of considerable size and it is fortunate that Dr. Wood has spoken more directly to those who are most in need of help and encouragement. Such officers will find this volume of the greatest value. The author has condensed a vast amount of detail into this book and in the main most successfully, particularly, when treating of the communicable diseases. Perhaps this has led at times to too dogmatic statements on matters concerning which there are still proper differences of opinion. *Chas. V. Chapin, M. D.*

Health Department Reports.

Prepared by A. D. Hiller.

Kenosha, Wisconsin.

The Annual Report of the Department of Health for the City of Kenosha is for the year ending April 30, 1917, and represents the first report under the new make-up of the department, to which staff has been added a chemist and bacteriologist, and a milk and food inspector.

We find out from the last line of the report that the population of this city is 31,576 and that the death-rate is 11.6 per 1,000 population—an excellent rate.

One thousand three hundred and ninety-five cases of contagious disease were reported.

Of the 76 cases of diphtheria, 13 died—too large a proportion. Doubtless this is due to the fact that free antitoxin is supplied neither by the state nor city, and too often the size of the administrated dose depends upon what the parents can afford—a deplorable condition, and neutralizing to a great extent the efforts of the Health Department.

Only two deaths resulted from the 41 cases of scarlet fever, which, according to the report "should be called scarlatina, as this is its proper name."

There were reported 979 cases of measles—"This much dread (by health workers) disease (and so little dreaded by many parents)." There were five deaths.

It is felt that much of the spread of contagious diseases will be curtailed with the completion of the isolation hospital, for the construction of which $20,000 has been appropriated.

Physical examinations of school children have been extended to the parochial schools, and now all children with the exception of the high school children are being examined.

A sanitary survey of the city is being made and so far has shown the presence of many unsuspected surface toilets—which are being eliminated.

In the report of the chemist and bacteriologist it is shown that the work and scope of work of the laboratory has greatly increased. It is, however, strange that in a city of this size, only 63 chemical analyses of milk and 60 bacteriological analyses should have been made.

Chief among the recommendations is that of a system of municipal collection of garbage, the passage of a modern milk ordinance, the establishing and maintenance of health and dental clinics for the poor children of the city, and the increase in the nursing staff in order to more readily check up on the contagious disease reports.

Mobile, Alabama.

The report of the activities of the Health Department of Mobile for the year ending December 30, 1916, is contained in the Report of the Board of Commissioners for that city.

Mobile has an estimated population of 60,000, nearly half of which is colored. The birth-rate per 1,000 population is reported as 17.8. Since the Alabama State Board of Health assumes that the lowest average birth-rate in the state is 25 per 1,000 population, it seems probable that Mobile does not have complete birth reporting.

There were 1,097 deaths reported in Mobile giving a general death-rate of 18.2 per 1,000 inhabitants. The colored death-rate was nearly twice the white rate, the former being 24.0, the latter, 13.8. Tuberculosis (all forms) was the chief cause of death with 143 deaths attributable to it. Bright's disease was next of importance with 131 deaths. Pellagra caused 46 deaths, a decrease of 11 deaths from the previous year.

Sixty-three cases of typhoid fever were reported, 50 white and 13 colored people were affected. Fifteen deaths resulted, giving a death-rate per 100,000 of 24.9. The rate, exclusive of non-residents, however, would be 14.9, a much better showing. There were reported two cases each of scarlet fever and diphtheria, no deaths resulting from the former and one death from the latter—a good record.

Two years have elapsed now without a case of smallpox for this city, though naturally the department does not cease to warn the people and to urge vaccination. Ten cases and one death were reported for infantile paralysis.

General sanitation is well maintained by the house-to-house inspection method. Mosquito breeding-places are being abolished, garbage containers are kept tightly covered, and open privies, on account of the extended sewer system, are disappearing.

In the laboratory nearly 4,000 examinations were made and the findings are well reported.

Deaths from all causes under 1 year of age numbered 110, 37 white and 73 colored, giving a rate, excluding still births, of 102.8 per 1,000 births. There were 35 deaths, under two years, due to diarrhœa and enteritis.

The report is well prepared and satisfactory. The work seems thorough and the rates reported, particularly for the whole population, are excellent.

Public Health Notes.

Abstracted by M. P. Horowitz.

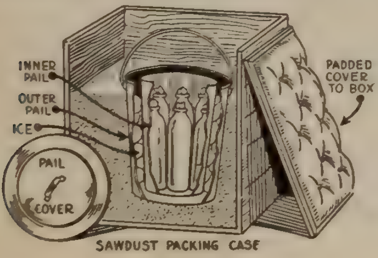
The Health of United States Soldiers.—According to the *Official Bulletin* for November 7, 1917, Col. W. P. Chamberlain who has recently visited many Regular Army, National Army and aviation camps, reports that the health of the soldiers is exceptionally good. The percentage of sick varies from 1 to 2 per cent. At Camp Pike the rate was higher, due to an epidemic of measles. The most serious disease found in the camps was pneumonia. The latest type of serum treatment is being used for the disease.

Each National Army camp is provided with a 1,000 bed hospital and adequate facilities for operations, X-ray, laboratories and diet kitchens. Great precautions have been taken to procure a safe water supply and to satisfactorily dispose of the sewage.

*

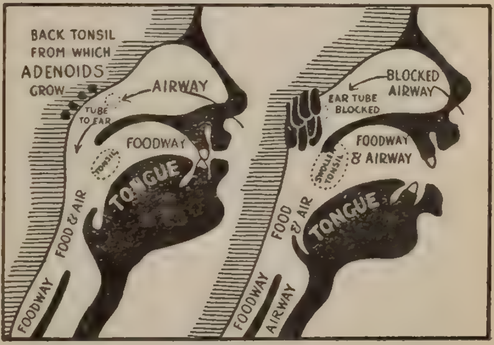
The following illustrations with comments are taken from an excellent booklet entitled "The Baby," and are reprinted by courtesy of the Massachusetts Department of Health.

Home-made Ice Box.—An ice box, as illustrated, can be made at home. Procure a wooden box about 18 inches square; put a layer of sawdust 3 inches thick in the bottom of the box; fill in with sawdust around a 10-quart tin pail. Around this pail a cardboard collar may be used to keep the sawdust in place. It is a good thing to put a layer of cheesecloth over the surface of the sawdust. Inside this pail place another smaller pail. If desired, the ice may be kept in the inner pail and the bottles placed in the larger pail. The pail should be securely covered and a bag of sawdust placed over it. The outer box should be tightly closed by a wooden cover lined with several thicknesses of newspaper. The inner pail should be taken out and cleaned every morning.

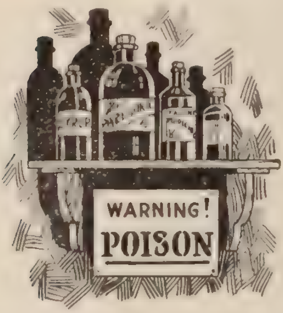


Warm the milk again before feeding. Never keep the feeding bottle warm all night, as the germs will ferment the milk and will make the baby sick.

Adenoids and Enlarged Tonsils.—A baby suffering from adenoids sleeps with mouth open, snuffles and cannot breathe freely. All babies who show any signs of trouble of this kind should be examined by a good physician, as later the same cause may lead to deafness and other defects which seriously hinder the child's growth, both of body and mind.



Protect the baby from your cold.



Soothing syrups or paregoric will not help the baby to cut teeth and are dangerous to use.

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Universal Military Training.—The following resolution was adopted unanimously by the Clinical Congress of Surgeons of North America at Chicago, October 25, 1917:

Whereas, The experiences of the nation convince us of the necessity for universal military training, to furnish qualified men for defense, to strengthen manhood and mental poise, and to make for a more efficient citizenship, and

Whereas, We believe it will democratize youth and furnish discipline, while developing physical force and endurance, and will produce better fathers and workers for the ranks of peace; therefore, be it

Resolved, That the Clinical Congress of Surgeons at its eighth annual session urges upon Congress at its coming session the passage of a measure along the general lines of the Chamberlain Bill for Universal Military Training, and that the cantonments now used by the National Army be utilized, if possible, for such work.

"Graphic Exhibits on Food Conservation at Fairs and Expositions" is the name of an attractive booklet issued by the United States Food Administration. The chapters have the following titles: Introductory; Save the Wheat; Economy in the Use of Fats; Other Food Exhibits; Food and War Facts; Appendix. The booklet is well illustrated, and might well serve as a model for health officers.

◆

A New Anæsthetic.—A new anæsthetic is apparently being used with much success on the European battlefront. It is used particularly to relieve pain in exposed surfaces of wounds. The anæsthetic is called nikalgin, and is composed of quinine, hydrochloric acid, and urea.—*The Boston Medical and Surgical Journal*, October 25, 1917.

◆

A Sanitary Privy System for Unsewered Towns and Villages.—Surgeon L. L. Lumsden, in *Public Health Bulletin No. 89*, of the United States Public Health Service, outlines a plan for the satisfactory disposal of fecal material from unsewered towns and villages. The recommendations are the result of investigations carried on throughout the country during 1914, 1915, and 1916. A sanitary privy system is suggested, consisting of water tight, cylindrical galvanized iron cans, 15 inches high and 15 inches in diameter. Each can is provided with a well fitting cover, and is placed in a privy house, which is thoroughly protected against flies, and which is ventilated by means of a flue pipe. It is estimated that one can is required for every group of five persons or less, and that the can should be replaced with a fresh one every seventh day. The plan is to have a scavenger service, which will collect the full cans, replace them with clean fresh ones, and dispose of the excreta. The method of disposal may be either by dumping into a sewer or by burial in the earth. In any case the can is washed and cleaned, dipped in a disinfecting solution and when replaced must contain about a pint of the disinfectant. It is desirable that the scavenger service should be operated under the direction of the municipal authorities. It is estimated that a charge of $3 to $4 per privy per year will insure a safe margin of profit.

Association News.

Rivers and Waterways Association Amalgamates with American Public Health Association.—Negotiations have for a number of months been under way to affiliate the National Association for Preventing the Polluting of Rivers and Waterways with the American Public Health Association. The work of the first named organization is closely related to that of the Sanitary Engineering Section of the American Public Health Association; in fact, a large proportion of the members are also members of the American Public Health Association.

The proposed merger was endorsed by the Sanitary Engineering Section at the Washington, D. C., meetings, and the final step toward affiliation was taken by the Executive Committee of the American Public Health Association, which on November 22 voted to accept the proposition of the Rivers and Waterways organization.

There were, last year, about twenty members in the National Association for Preventing the Pollution of Rivers and Waterways.

As was stated by Mr. H. deB. Parsons, Secretary of this Association, a few strong associations are better than a number of small ones.

In union there is strength. We are glad to welcome the Rivers and Waterways people, and hope that other of the smaller sanitary societies will follow their example.

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Health Employment Bureau.—Owing to the changes in occupation occasioned by the war, all registrants in the Health Employment Bureau have been asked to register anew. Health officers, sanitary engineers, medical inspectors, bacteriologists, chemists, sanitary inspectors, statisticians, teachers, etc., are invited to register. Registration is free to members. Lists of applicants are furnished to prospective employers free of charge.

An improvement has been made in the filing system, so that lists can usually be sent out on the same day the request is received. *In writing for names, please state the nature of the position, and especially the salary and the qualifications demanded, such as the M. D. certificate in public health, etc.*

Teachers in public health and medical schools are urged to call this service to the attention of their students.

Another item relative to health employment is to be found in the Public Health Notes Section.

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Executive Committee Meets.—On November 22, the Executive Committee of the American Public Health Association meet in New York City to consider the plans of the Association for the coming year. Those present were: President, Dr. Chas. J. Hastings; Treasurer, Dr. Lee K. Frankel; Secretary, A. W. Hedrich; Dr. W. A. Evans and Dr. Peter H. Bryce.

Inasmuch as the development of the Association and the Journal hinges primarily upon the funds available, questions of finance formed a large part of the discussions of the meeting. The following measures are to be adopted for increasing the revenue of the Association:

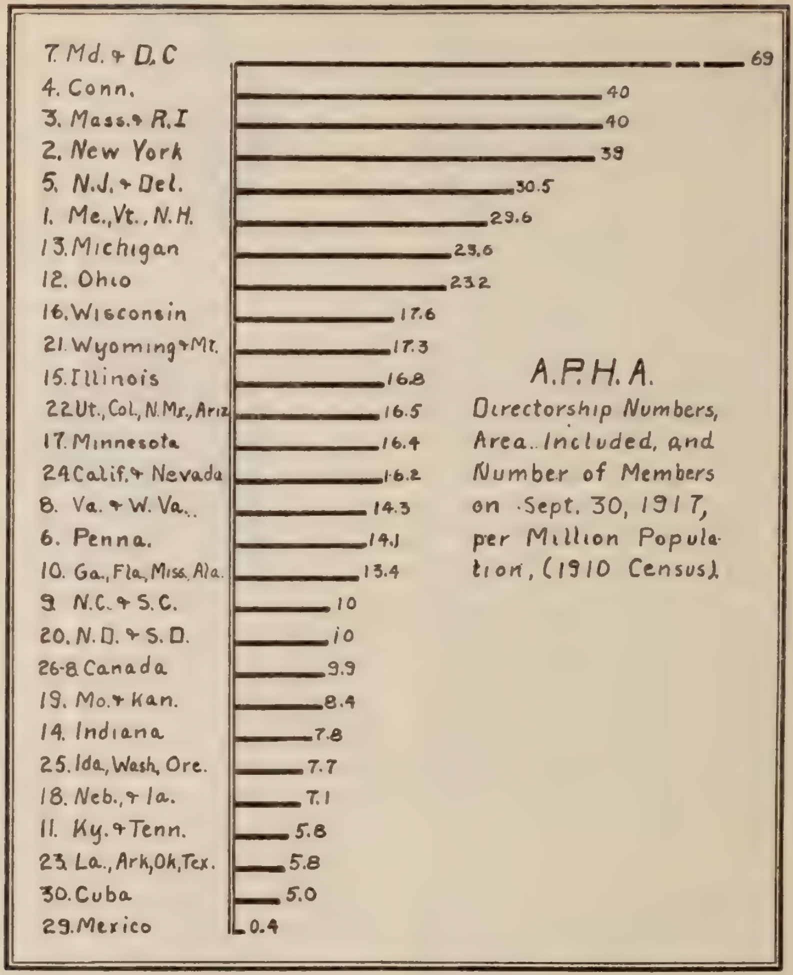
1. Beginning January 1, 1918, the subscription price of the Journal will be $4.00 per year, instead of $3.00, as heretofore.

2. There will be a campaign for corporate memberships at from $50 per year upward. Life insurance companies are considered especially favorable prospects for membership, since they benefit greatly from lowered death-rates brought about by public health activities which are promoted by the Association.

A committee on corporate memberships has been appointed, consisting of Doctors Hastings, Evans and Frankel. Early in December, the committee will appear before a meeting of the Association of Life Insurance Presidents to explain the work of the American Public Health Association.

One pledge of $1,000 per year has already been made, subject to the proviso that other companies join in taking out corporate memberships.

3. Dr. Evans and Mr. Hedrich were appointed a committee to increase the sale of advertising in the Journal. The advice of experts is that the advertising of the Journal could be made a profitable source of revenue from high-class advertisers. The potential gain from this source probably equals the profit from about 2,000 additional memberships.



It is of the greatest importance that members of the Association favor advertisers whenever possible by giving them an opportunity to bid for supplies, and, other things being equal, by patronizing the advertiser. The least that any member can do is to read the advertisements, and to invariably mention the JOURNAL when writing for supplies.

Already, more than ten pages of new advertising per month have been sold.

4. A campaign for new individual memberships will soon be undertaken in coöperation with the directors and members of the Association. The chart reproduced herewith shows the number of memberships per million population in each of the directorship districts. It is evident that there is great opportunity for expansion in the South, the Middle West, and the Far West. In districts 11 and 23 for example, comprising Kentucky, Tennessee, Louisiana, Arkansas, Oklahoma and Texas, the membership rate is only a fifth that of Connecticut, Massachusetts, Rhode Island, and New York.

How does your district stand?

The Next Meeting Place of the American Public Health Association.—This question has not yet been definitely settled. It was decided by the Executive Committee to hold the matter in abeyance until the next meeting of the Committee, to be held in the early spring, when it would be easier to gauge conditions associated with the war.

Personal Notes.

Prof. S. M. Gunn, until recently Secretary-Editor for the American Public Health Association, writes from Paris, France, that the work of the Tuberculosis Commission of the International Health Board, of which he is Associate Director, is progressing nicely. Films and exhibits are now ready for traveling. Recently the members of the Commission, including Dr. Livingston Farrand, Mr. Homer Folks, Dr. J. A. Miller and Prof. S. M. Gunn, were received by President Poincaré, who expressed the appreciation of the French people for the assistance rendered to bleeding France by America. The address of the Commission is 218, Rue de Rivoli, Paris, France.

Dr. Gustav F. Ruediger has resigned as the Director of the Hygienic Institute for La Salle, Oglesby and Peru, Ill. He is succeeded by Dr. Carl F. Raver, formerly of Aberdeen, S. D.

Prof. Burt L. Rickards headed a long list of competitors in the Civil Service examinations for the post of Assistant Deputy Commissioner of the State Board of Health of New York, and has been appointed to that position.—*Boston Med. & Surg. Jour.*

Prof. W. Lee Lewis of Northwestern University, Evanston, Ill., has been commissioned Captain, Officers Reserve Corps, to do work relating to gases in offensive work.

Mr. Homer I. Huntington has entered the United States Public Health Service, taking part in the dairy sanitation work at Camp Pike, Ark.

Mr. N. A. Nelson, formerly of New Castle, has through the medium of the Health Employment Bureau of the Association, been appointed Assistant Superintendent of the Cincinnati Anti-Tuberculosis League. Mr. Nelson says: "I will always be an enthusiastic 'booster' for the Employment Bureau."

Mr. Malcolm Lewis, formerly Joint Health Officer to Millburn and South Orange townships, N. J., is now Epidemiologist to the State Board of Health of New Jersey.

Mr. Albert H. Jewell, of Lansing, Mich., has been commissioned 1st Lieutenant, Sanitary Reserve Corps, and is stationed at the Signal Aviation School, Mt. Clemens, Mich. He is in charge of water purification, sewage disposal, garbage collection and disposal, and inspection of barracks and mess halls.

Dr. Vernon Robbins is now Field Director of Sanitation, State Board of Health, Montgomery, Ala.

Dr. Gustav F. Ruediger, for the last three and a half years Director of the Hygienic Institute for LaSalle, Peru and Oglesby, Illinois, has resigned that position to become Director of the State Hygienic Laboratory of Nevada, University of Nevada, Reno.

Prof. Severance Burrage, who was sent by the Red Cross to investigate sanitary conditions in Serbia, has returned to Boston.

Mr. H. R. Hamilton, research student at Massachusetts Institute of Technology, has been commissioned 1st Lieutenant, Army Sanitary Corps.

Mr. E. B. Johnson, of Newburyport, Mass., is at Montgomery, Ala., as Chief Sanitary Inspector of the American Red Cross.

Ill health has compelled Dr. W. H. Frost to temporarily give up his work as Director of the Sanitary Service Bureau of the American Red Cross. His place is at present being taken by Surgeon Paul Preble.

Mr. E. D. Reynolds is a bacteriologist of the Red Cross Sanitary Unit No. 14, at Fort Warren, Ga.

Mr. Paul F. Nichols, former Assistant Health Officer at Summit, N. J., is now stationed at Camp Devens, Mass.

Mr. T. J. Duffield, formerly Health Officer at Summit, N. J., is now 1st Lieutenant, Sanitary Corps, N. A., Base Hospital, Camp Lee, Va.

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The following members have removed without giving us their new addresses. The Editor will be grateful for any information which you may be able to furnish.

Last known address:

Amyot, John A., M. D., 4 Laburmen Avenue, Toronto, Ontario.

Baker, Mr. John, 539 Main Street, Stamford, Connecticut.

Bentley, D. B., M. D., Sarnia, Ontario.

Clore, Mr. Lex B., Marion Club, Indianapolis, Indiana.

Cooke, Lane B., M. D., care American Consul, Vera Cruz, Mexico.

Craft, Clarence C., M. D., Postou, South Carolina.

Diggett, Mr. E. W., Tallahassee, Florida.

Gillihan, Allen F., M. D., Oakland, California.

Halsey, William H., M. D., Washington, D. C.

Hidy, Klore Wm., M. D., 717 South Figueroa Street, Los Angeles, California.

Holdredge, Mr. Leigh I., 66 West 10th Street, New York City.

Jackson, Elmer C., M. D., 622 Fourth Avenue, Ashland, Wisconsin.

Law, Edwin Augustus, M. D., 71 Church Street, Bartow, Florida.

Lougee, Lester B., M. D., Marcella, New York.

Ludwig, Mr. Ernest, The Leader-News Building, Cleveland, Ohio.

* Mills, Mr. Dudley A., Channel Isle, Jersey, England.

Molloy, Daniel M., M. D., Marine Hospital, New Orleans, Louisiana.

Murphy, Mr. Lyman C., City Hall, Chicago, Illinois.

Nicol, Mr. Norman C., 17 Gramercy Park, New York City.

Platt, Mr. Philip S., 105 East 22nd Street, New York City.

Rahn, Prof. Otto, 1111 West Stoughton Street, Urbana, Illinois.

Reinoehl, Mr. John Krause, Las Cascadas, Canal Zone.

*Russell, J. B., M. D., Glasgow, Scotland.

Sawyer, Mr. F. L., 158 Whitney Place, Buffalo, New York.

Seabright, Mr. John E., North Jefferson Street, Bellevue, Ohio.

Simpson, R. M., M. D., 702 Sterling Bank, Winnipeg, Manitoba.

Taylor, John R., M. D., 22 Prospect Avenue, Madison, Wisconsin.

Tvedt, Mr. H. S., 268 State Street, Boston, Massachusetts.

Ward, Mr. Herbert C., 379 Agnes Avenue, Detroit, Michigan.

Warriner, Mr. Carlos E., City Hall, Fort William, Ontario.

Williams, Jesse L., M. D., 415 St. James Building, Jacksonville, Florida.

Wilson, Mr. William H., 41 Broad Street, New York City.

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Elected to membership in the American Public Health Association:

O. J. Hallenbeck, Canandaigua, N. Y. Physician, Surgeon, Health Officer.

Ross Leonard Dobbin, Peterborough, Ontario, Canada. Civil Engineer.

Byron U. Richards, Pawtucket, R. I. Secretary State Board of Health.

Alexander C. Bulla, Winston-Salem, N. C. Health Officer.

Nelson Eugene Young, Williamsport, Pa. Former Health Officer.

Home Economics Department, Utah Agricultural College, Logan, Utah.

Edward James Tucker, Washington, D. C. Captain Sanitary Corps, U. S. N. A.

Alexander Monro Grier, Wilmington, Del. Sanitary Engineer and Health Officer.

James Frederick Rogers, New Haven, Conn. Teacher of Physiology and Hygiene, Practice of Medicine.

Charlotte Hoffman, R. N., Battle Creek, Mich. Public Health Nurse.

Alonzo Blauvelt, M. D., New York, N. Y. Assistant Sanitary Superintendent Department of Health.

Ross Leonard Layburn, Leavenworth, Kan. Bacteriologist for Red Cross Sanitary Unit No. 5.

Robert Rae Harkness, York Village, Me. Health Officer.

Grace Pearce Crosby, Danville, Ill. Veterinarian, Trained Nurse.

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Laboratory Notes.

Abstracted by Dr. Arthur Lederer.

APPARATUS AND TECHNIQUE.

A Traveling Field Laboratory in New Jersey.—The article describes the field laboratory installed in a delivery wagon body on an automobile well equipped for milk and water analysis.—Anon, *Eng. Contr., 48, 107.*

⁂

A New Illuminator for Microscopes.—The new device serves as a source of illumination for opaque subjects. A small circular tube-lamp surrounds the objective and is attached to a holder which is clamped to the microscope tube. In micro-photography the lamp has been used to good advantage.—A. Silverman, *Jour. Ind. Eng. Chem., 9, 971.*

⁂

A Substitute for Gloves.—By mixing a solution of the condensation product of formaldehyde and phenol with a solution of cellulose-esters a product is obtained, provided the proper solvents are used, from which can be precipitated a durable, impermeable, sterile, and bactericidal covering for the hands. It has the trade name "manutect."—Anon, *Muenchen. med. Wochnschr., 63, 967.—Chem. Centralbl. 1916, II, 417.—Chem. Abstr., 11, 2685.*

⁂

An Electrically Heated, Constant-Temperature Water Bath for Serologic Work.—An electrically heated and controlled bath has manifest advantages over any other kind. The illustration of the apparatus shows it to be neat and compact. It is manufactured by the Chicago Surgical and Electric Company.—Oscar A. Schultz, *Jour. Am. Med. Assn., 69, 1521.*

⁂

CHEMISTRY.

A New Test for Chlorine in Drinking Water and Its Application for the Estimation of the Chlorine Present.—100 cc. of distilled water are placed in a Nessler tube, 1 cc. of 0.1 per cent. benzidine solution in 10 per cent. hydrochloric acid are added and the mixture allowed to stand five minutes. The blue color which develops changes rapidly to a bright yellow. The color is compared with a standard. O-tolidine may also be used, and in some cases is preferable. The method will detect 0.005 p. p. m. of chlorine.—R. L. Mackenzie Wallis, *Ind. Jour. Med. Research, 4, 797.*

⁂

The Determination of Fat in Certain Milk Products.—A method for determining fat, including treatment of the samples, in such dairy products as ice cream, evaporated milk, malted, dried skim milk, and similar milk products, is described. The procedure is similar to that followed when using the well-known Babcock test, but in place of sulfuric acid, mixtures of glacial acetic, sulfuric and nitric acids are prescribed. The fat is separated and read in a Babcock bottle.—C. K. Francis and D. G. Morgan, *Oklahoma Agr. Exp. St. Bull., 114.—Jour. Ind. Eng. Chem., 9, 861.*

⁂

Application of the Cryoscopic Method for Determining Added Water in Milk.—The freezing point figure of milk is the most important constant yet obtained and the safest basis upon which to draw conclusions as to the presence or absence of added water. The presence of 5 per cent. added water can be detected in the majority of cases. The presence of formaldehyde lowers the freezing point. The milk must be reasonably fresh. An increased acidity interferes with the accuracy of the test.—J. T. Keister, *Jour. Ind. Eng. Chem., 9, 862.*

⁂

BACTERIOLOGY AND PATHOLOGY.

Antityphoid Vaccination and the Agglutination Test in Typhoid and Paratyphoid Fever.—In non-vaccinated individuals the agglutination test is of the greatest practical value for diagnosing infections caused by the bacilli of the typhoid group. In individuals, having been previously vaccinated against B. typhosus, the agglutination test is absolutely unable to confirm a clinical diagnosis of typhoid. In a case of clinically confirmed typhoid occurring in a previously vaccinated individual, the agglutination test has a practical diagnostic value whenever it shows a constant predominance of the agglutination titer for one of the paratyphoid germs. This, however, is a rare finding. Blood culture is the only reliable method to ascertain whether a typhoid infection occurring in a vaccinated individual is due to B. typhosus or to one of the paratyphoid germs.—E. Rist, *Jour. Lab. and Clin. Med.*, *3*, *1*.

⁂

The Effect of the Natural Antisheep Hemolysin Content of Human Serum on Complement Fixation Tests.—Contrary to the results obtained by many students of serologic problems, the experiments show that the effect of natural antisheep hemolysin in the practical operation of the Wassermann test is negligible. In the case of the gonococcus complement fixation test, it would seem to be advisable to absorb the natural hemolysin from sera showing a very great excess, since stronger specific fixations have in some instances been obtained with sera treated by this method.—Anna I. van Saun, *Jour. Lab. and Clin. Med.*, *3*, *59*.

⁂

The Wassermann Reaction with Large Amounts of Patient's Serum.—The use of large amounts of serum as recommended by Kromayer did not change a serum giving a negative result to one giving a positive if a double serum control (0.8 cc.) has been used, and the result of the test read only when this control was completely hemolyzed. Since large amounts of serum may of themselves bind complement without the addition of a Wassermann antigen, Kromayer's modification of employing large amounts of patient's serum is not considered safe.—Ann I. van Saun, *Jour. Lab. and Clin. Med.*, *3*, *61*.

⁂

The Use of a Vegetable Bouillon as a Culture Medium.—The following broth may be used as a substitute for the ordinary meat infusion: Water, 4 liters; potato, 300 grams; carrots, 150 grams; turnips, 150 grams.

Peel the potatoes, and wash the carrots and turnips, cut them all into small pieces and place them into cold water. Boil for four hours, strain, and make up the three liters, titrate and render feebly alkali. Heat in the outer plate at 120° C. for one-half hour, allow to stand over night in the refrigerator, and filter through paper.—Albert Berthelot, *Compt. rend. Soc. de. biol. Par.*, *80*, *131*; *Abstra. Bact.*, *1*, *221*.

The Sensitiveness of Tubercle and Other Acid-fast Bacilli to Acids.—A very great difference was demonstrated between tubercle and other acid-fast bacilli in sensitiveness to both organic and inorganic acids. Tubercle bacilli were killed in 24 hours by 0.1 N acid, but could resist more dilute acids. Other acid-fast bacilli were killed in N/80 acid. No difference could be detected in sensitiveness between human and bovine bacilli.—A. E. Porter, *Jour. Hyg.*, *16*, *66*.

⁂

The Agglutination of the Diphtheria Bacillus.—With the use of a monovalent serum, two groups of the bacteria bacilli were distinguished, one of which is agglutinated, and the other not, although by the usual means of identification both are considered typical diphtheria bacilli. Clinically, the non-agglutinating organisms occur in mild infections and in bacilli carriers. —H. Langer, *Centralbl. f. Bakteriol.*, *Part II*, *78*, *117*.—*Chem. Zentr.*, *1916*, *II*, *413*.—*Chem. Abstr.*, *11*, *2813*.

⁂

Acid-Fast Organisms in Distilled Water.—Distilled water may be divided into sterile, sterilized, clean and dirty water. Sterile distilled water is free from all bacterial bodies. Distilled water may be contaminated in the still, the tank or collecting bottle, and show different types of organisms including acid-fasts in most instances. The acid-fasts may or may not be morphologically like the tubercle bacillus. The larger the amount of sediment, and the older the water, the greater the number of acid-fasts. In perfectly clean, but non-sterile distilled water acid-fasts may appear after standing for a month. In all bacteriologic work it is advisable to use sterile distilled water collected in sterile containers.—R. A. Keilty, *Jour. Med. Research*, *37*, *183*.—*Jour. Am. Med. Assn.*, *69*, *1200*.

⁂

Examination of Feces With and Without Centrifugation.—The method of centrifugation increases the positive findings by 14 per cent. The method is most valuable in localities where intestinal parasites are not frequently found. —P. L. Querens, *Interstate Med. Jour.*, *24*, *282*; *Bact. Abst.*, *I*, *223*.

Vol. VII. DECEMBER, 1917. No. 12.

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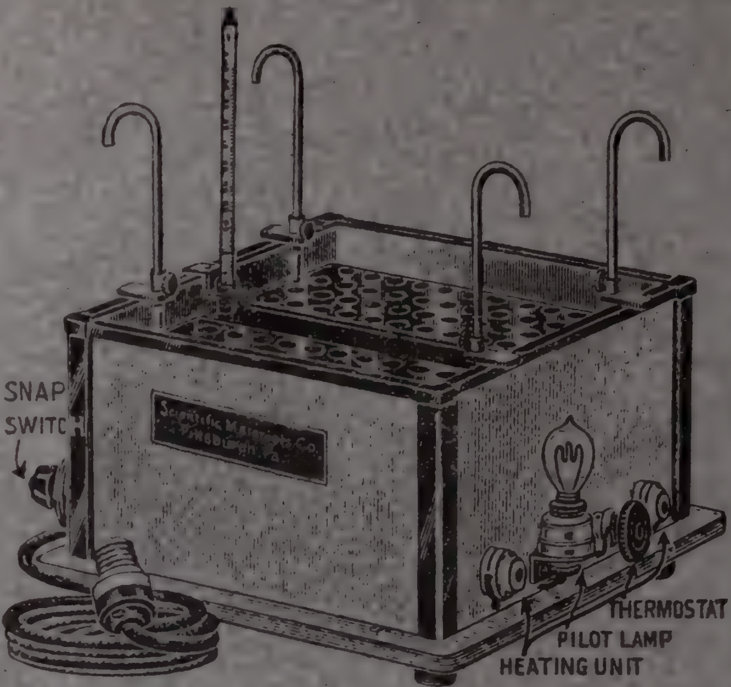

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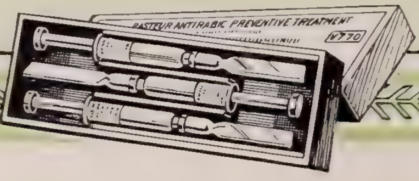

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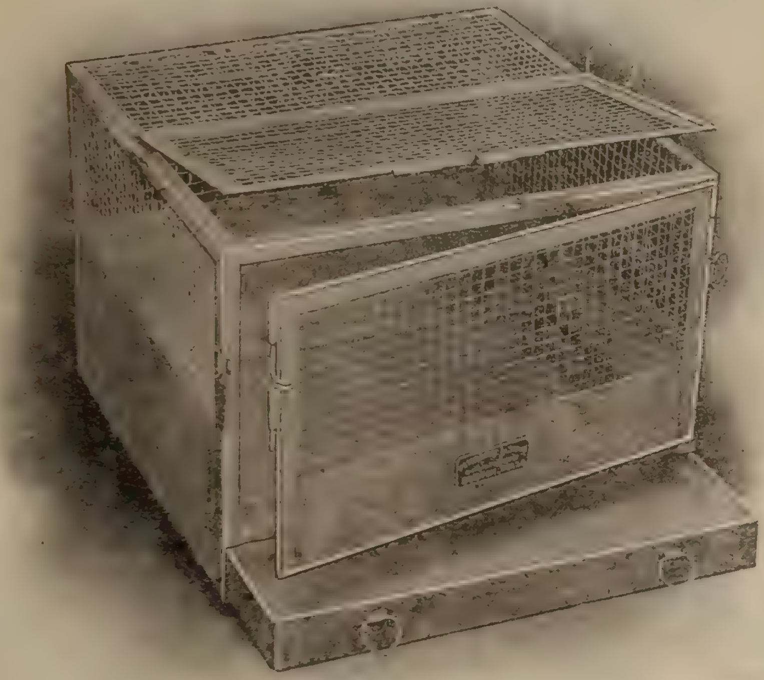

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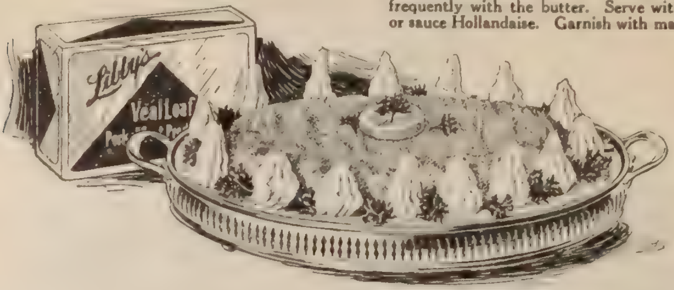

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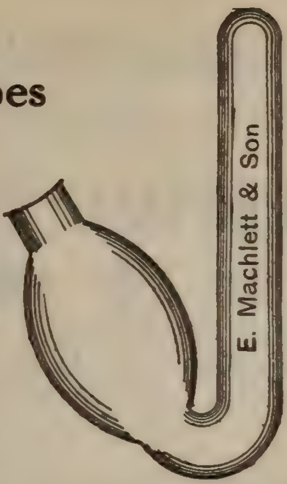

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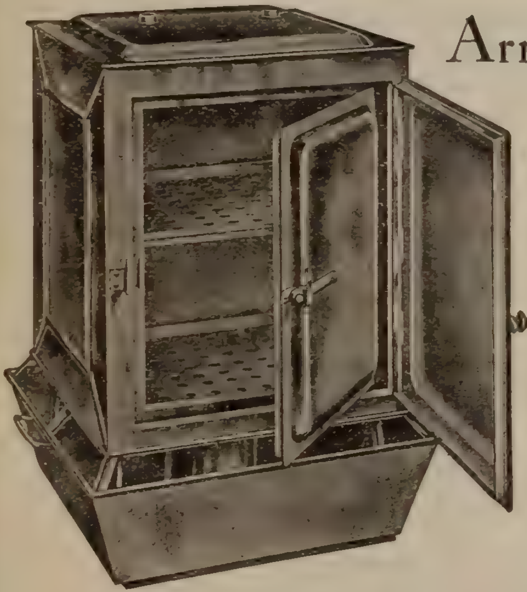

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"Arrah now, Bridget," said Norah, "an' there ye are wid another little Carr in yer arms."

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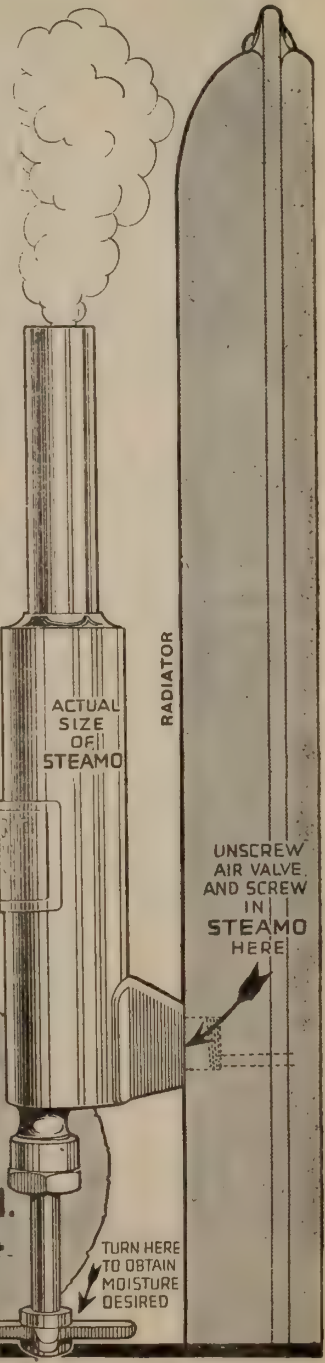

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" 'Taint," responded the garrulous native.

"Why, then," the stranger queried, "should the dog howl?"

"Lazy."

"But why does laziness make him howl?"

"Wal," said the Georgian, "that blame fool dawg is sittin' on a sand-bur, an' he's too tarnation lazy to get off, so he jes' sets thar an' howls 'cause it hurts."—*Journal American Medical Association.*

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Newark Evening News.—Journal American Medical Association.

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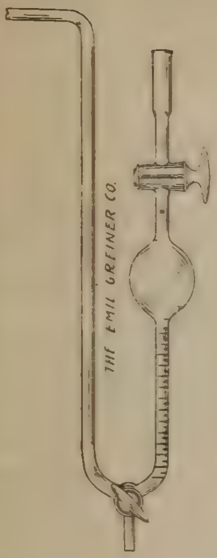

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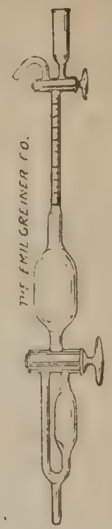

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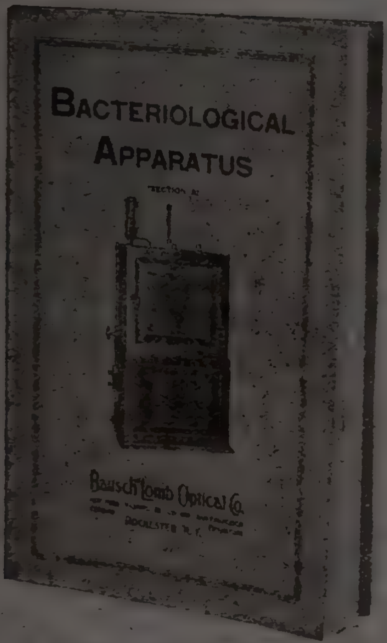

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The Freas' Electric Incubator

Approved by the National Board of Fire Underwriters

Universally recognized as the most accurate and durable incubator available, and the only type that can be depended upon for continuous unattended operation. Made in Six sizes

The undermentioned advantages of the Freas' Electric Incubator strongly recommend its use—where electricity is available—in preference to any other incubator.

1. The almost perfect insulation against loss of heat by radiation cuts down the current consumption to about one-half that required for other forms. This implies less heating up of the laboratory, less strain on the wiring, less danger of sparking, and in general longer and more satisfactory service.

2. The "all-metal" regulating device maintains constant temperature indefinitely to a fraction of a degree.

3. To set for the temperature desired requires but a few moments of time. This is accomplished by simply turning a milled-head screw, which moves the indicator up or down the graduated temperature scale.

Contrast this with the time required to set a mercury or other regulator of the most advanced type; the continuous watching required on account of the uncertainty of its proper and accurate regulation.

4. There are no complicated devices for heating, regulation, etc. The rugged construction of all parts of the Freas' Incubator is such that, with ordinary care, no parts are liable to get out of order.

5. Water is not required, nor employed, to maintain an even temperature throughout the chamber, thereby eliminating leakage, a disadvantage so common with copper incubators. The specifications explain the reasons for this advantage of the Freas' Incubator.

6. No auxiliary devices are needed. To operate, it is only necessary to screw the plug into a lamp socket, and turn on the current. The incubator will operate on either direct or alternating current. *When ordering specify the voltage.*

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